effects ▸ editing ▸ premiere ▸ filming ▸ paint* ▸ capturing ▸ effect* ▸ compression ▸ after effects ▸ optimisation ▸ output

computer arts special

complete with dual-format CD

The definitive guide to digital video ▸ Mac & PC

- ▸ Create for broadcast, multimedia and the Web
- ▸ Complete desktop film making walkthroughs
- ▸ Essential hardware and software buyer's guides
- ▸ New Premiere, paint* & After Effects tutorials

Digital video

The revolution is here!

Top tips & techniques

Advice from the pros

From inspiration to the premiere, everything you need to know...

issue 04 1999 £5
10
Future Publishing
Your Guarantee Of Value
9 771465 112003

Accurate

Get a perfect reflection of your idea with the LaCie electron22blue™. Its flat screen CRT technology displays an image which is shielded from outside light influence by LaCie's color-enhancing blue hood – all on a vertically and horizontally flat screen that eliminates distortion, so you can be sure the idea you see is the idea you get.

where to buy: info.uk@euro.lacie.com tel: 020 78 72 8000

www.lacie.com/pb19.htm LaCie electron19blue and the LaCie logo are trademarks of LaCie, Ltd. ©1998 LaCie, Ltd. All rights reserved.

BEST Digit BUY

Illustration: **Mad Frank** e madfrank@bartucca.dircon.co.uk

Welcome to computer arts special

The definitive guide to digital video • Mac & PC

The revolution is here!

And you probably haven't even noticed yet. As we point out later on, digital video has been touted for years as the Next Big Thing. Truth is, it's already here in a big way.

All over the world, digital video is being used by broadcasters, film makers, multimedia producers, Web site designers and home hobbyists to stunning effect. Why? Because it's cheap, extremely versatile, and opens up a whole world of creative possibilities previously available only to those with many thousands of pounds' worth of equipment.

Digital video offers so many possibilities, it's hard to know where to start. Maybe you want to spice up your Web site with some footage, or perhaps your multimedia productions lack that certain something. Or, most likely of all, you want to explore the hugely exciting – if daunting – possibility of creating your own feature film on your own desktop Mac- or PC-based system at home.

That's what this *Special* is all about. Within, you'll find pages and pages of walkthroughs, tutorials, tips and techniques covering every stage of digital video production, from filming to output. You'll learn about storyboarding, editing, special effects, compression and more – and get tips from the pros too. Here we go... ca>s

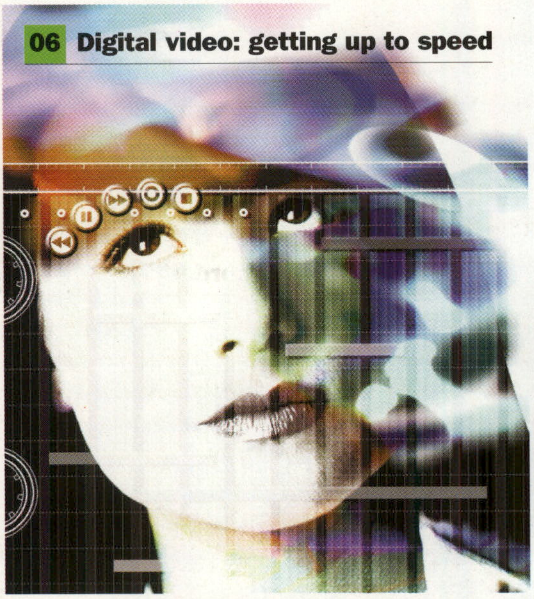
computer arts special
The definitive guide to digital video • Mac & PC

cas04

issue 04 october 99

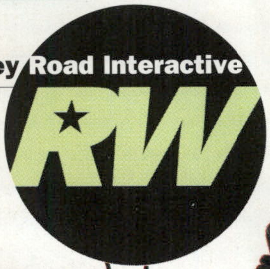
contents

tutorials: 51 pages ▸ showcases: 3 ▸ demos: 9 ▸ Buyer's Guide: 8 pages

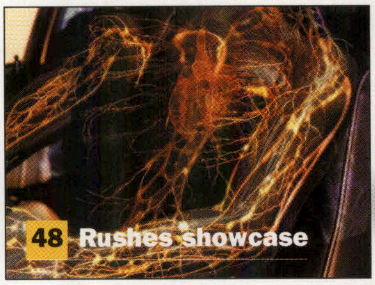


06 Digital video: getting up to speed

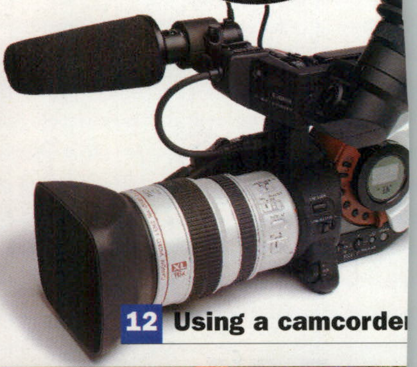
30 paint* and effect*



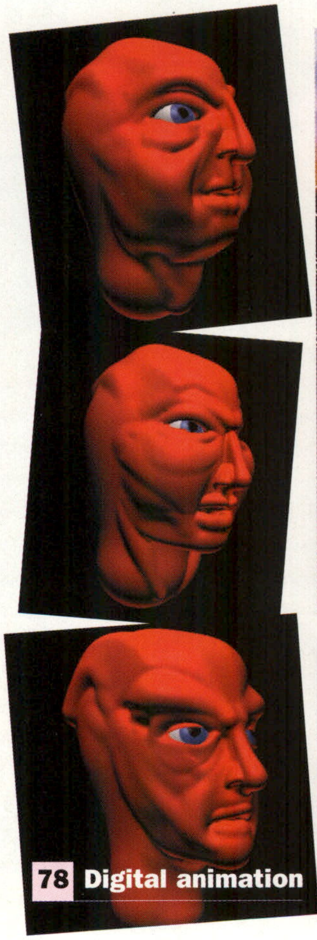
60 Abbey Road Interactive



48 Rushes showcase



12 Using a camcorder



78 Digital animation

76 Mirashade showcase

18 Win a camcorder!

56 Desktop filmmaking

computer arts special
The definitive guide to digital video • Mac & PC

Subscriptions – page 66 / 98

Future Publishing Ltd, FREEPOST,
BS4900, Somerton, Somerset, TA11 7B

t Customer hotline: 01458 271 108
f 01458 274 378
e subs@futurenet.co.uk

Editorial t 01225 442244

Ed Ricketts editor
e ed.ricketts@futurenet.co.uk

Darren Rhodes CD editor
e darren.rhodes@futurenet.co.uk

Annelise Brant art editor
e annelise.brant@futurenet.co.uk

Nick Nettleton production editor
e nick.nettleton@futurenet.co.uk

Contributions from:
Frank Bartucca, Josse Bilson, Lindsay Bruce, Myles Cummings, Simon Danaher, Christian Darkin, Morgan Holt, Sarah Hughes, Clare Lydon, Emma Shield

Contact Computer Arts Specials
Future Publishing
30 Monmouth Street
Bath BA1 2BW
t 01225 442244
f 01225 732 361
i iSDN 01225 732 346
w www.computerarts.co.uk

CD problems technical support
e support@futurenet.co.uk
t 01225 442244

Overseas licensing Chris Power
e chris.power@futurenet.co.uk
t 01225 442244

Advertising t 01225 442244
Belinda Symington corporate accounts mgr
e belinda.symington@futurenet.co.uk

Rob Bennett advertising manager
e rob.bennett@futurenet.co.uk

Alex Richards sales executive
e alex.richards@futurenet.co.uk

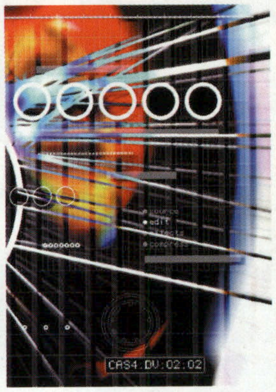
t 01225 442244
f 01225 732 282

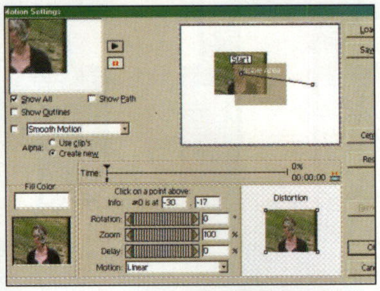
Duncan MacDonald production coordinator
Liz Britton marketing executive
Matthew Eglinton print coordinator
Martin Smith pre-press manager
Jon Bickley group publisher

Production of Computer Arts
Hardware: Blue G3/350, G3/266 7300/200, 7600/120, 8500/120 PowerMacs, HP Vectra VE, HP Kayak dual PII 400MHz and a UMAX 600S scanner
Software: *Director, FreeHand, Photoshop, XPress*
Cover: madfrank@bartucca.dircon.co.uk
Printed at **Cradley Print, UK**

All rights reserved. All trademarks and copyrights in this issue are recognised, and are acknowledged where possible. If we have failed to credit your copyright then do please contact us – we'll happily correct any oversight. Any material submitted is accepted on the basis of a worldwide right to publish in printed or electronic form – be sure to clearly label all discs. All contents © Future Publishing 1999

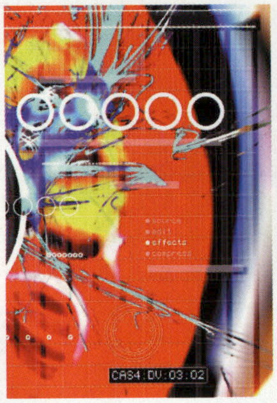
22 Adobe Premiere




Motion Settings
☑ Show All ☐ Show Path
☐ Show Outlines
☐ Smooth Motion
Alpha: ○ Use clip's ● Create new
Time: 0% 00:00:00
Click on a point above:
Info: #0 is at -30 , -17
Rotation: 0 °
Zoom: 100 %
Delay: 0 %
Motion: Linear

Master the basics of editing on a real project, using Adobe's industry-standard package.

40 Special effects



Adding special effects to your footage can be challenging but very rewarding. Discover some top tips...

94 CD Interactive

On the *Computer Arts Digital Video* CD:

Demo software: *Premiere 5, After Effects 4, Commotion 2, paint* 2, effect* 2, Media Cleaner Pro 4, MediaPaint* (all Mac and PC); *VideoShop 4.5* (Mac only); *MediaStudio Pro 5* (PC only).

Movies: Showreels from Rushes, Mirashade and Abbey Road Interactive; results of desktop filmmaking tutorials.

Showcases: Adobe *After Effects* Tour; Artbeats sampler.

Plus: software resources and tutorial files for the desktop filmmaking series.

06 Getting up to speed
Just what is digital video, how can it help you and what do you need to produce it? Start here for the answers to all your questions...

10 First steps: capturing
Camcorders, cards, computers and codecs – the things you need to know.

12 Using a DV camcorder
Before you splash out on the latest model, find out what you need – and just how to use it.

14 Using a capture card
It's not so hard, y'know...

15 Source Buyer's Guide
The best capture cards and DV camcorders examined.

18 Win a DV camcorder!
A top digital video camcorder from Canon up for grabs!

20 Introduction to editing
Why chopping up your footage is a good thing...

22 Premiere tutorial
Tips & techniques for using Adobe's excellent package.

28 paint* & effect*
Top post-production house The Mill examines these exciting desktop editing packages from Discreet– can they compete with pro systems costing hundreds of thousands of pounds?

32 Editing Buyer's Guide
Software packages from £20 to £560,000 – which one is best for you?

36 Back issues
Get hold of previous *Specials* and regular *Computer Arts*.

37 Win an Adobe collection!
The Dynamic Media Collection includes four top packages: *Premiere 5*, *After Effects 4*, *Illustrator 8* & *Photoshop 5.5*. And you could win it...

38 Special effects tutorial
It's not all explosions and dinosaurs – special effects can also rescue footage. Follow our *After Effects* tutorial here...

45 Effects Buyer's Guide
The best *After Effects* plug-ins, and more besides.

48 Rushes showcase
The veteran post-production house spills its secrets.

50 Compression
Which compression method should you use, and how?

52 Digital video glossary
Bemusing jargon and abbreviations explained.

56 Desktop filmmaking 1
We kick off our comprehensive series.

60 Abbey Road Interactive
The bustling multimedia production house shows off.

62 Desktop filmmaking 2
Completing a rough edit.

66 Subscribe to CA
Save money on the best-selling mag for creatives.

68 Desktop filmmaking 3
Adding titling and special effects to our movie.

72 Desktop filmmaking 4
The final edit.

76 Mirashade showcase
Interesting corporate videos? Mirashade shows how it's done...

78 Digital animation
Digital video doesn't have to be real. In this four-part series we build and animate a five-minute 3D fantasy...

94 CD Interactive
Get the best from your CD.

98 Subscribe to Specials
Get the next four *Specials* and don't miss a thing.

digital

design

The new revolution

FOR SOME TIME WE'VE BEEN HEARING ABOUT HOW DIGITAL VIDEO WILL REVOLUTIONISE FILMING, HOW IT WILL BRING HOLLYWOOD TO THE MASSES, HOW EASY IT ALL IS. THE TRUTH IS – THE REVOLUTION HAS ALREADY STARTED...

Digital video is here right now, and it's here to stay. The thing is, like a good special effect in a movie, you might not even have noticed it yet.

For a start, perhaps we should stop calling it video. Video has all these associations with poor quality images with lines across them. Perhaps we should call it digital film-making. After all, it's film makers who are making the boldest strides with the new digital video format.

Despite the best efforts of the camera makers to distract the pros, DV now has the formal endorsement of film-makers like Hal Hartley, Jim Jarmusch and Lars von Trier. Their own feature-length DV movies are, if not at a cinema near you, at least on the way. The artists are on-board, and the format's become everyone's watchword, from professional documentary makers to students.

Just how good is it?

Digital video isn't as good as Academy-approved 35mm film, and doesn't claim to be, but it's fast catching up with Super 16mm – the film format of choice for independent cinema. And with the imminent industry-wide introduction of high definition television (HDTV), film lovers are clinging to their loyalties like crazy.

By its very nature, digital has changed the world. The watch-word of the computer industry is 'piracy' and that means instant, identical copies. Digital video, being a stream of numbers, can be copied from source to target as many times as you like, without any change in quality.

In bygone days, only professional video formats such as Betacam SP could take all the digital effects and the multiple copies and still look half-decent on the screen. Anyone who's tried dubbing one tape to another, whether VHS or Hi-8, will know how quickly quality can drop. With digital video, generation loss becomes a thing of the past and with technology growing to serve demand, Web video and faster-than-real-time transfers are considerably closer than the horizon.

At around the same time as video went digital, there came non-linear editing. Moving image stock no longer needed to be chopped up and glued back together, because computers could be told when to play and stop a tape. They didn't need to be powerful and, inevitably, it was the humble PC and Mac that took on the role of Fat Controller. With more and more video being digitised onto computers, editing on- screen inevitably became a feature of the home computer.

With home video editing promising to be a tasty market – albeit a morsel beside broadcast – the camcorder makers thought up a nifty little home user format called DV. Even if it did confuse some because of DVD (the similarity stops with the initials), it seemed a nice way to take Hi-8 to the next stage. They didn't expect that DV would end up so damn good.

Firewire arrives

Listen to the marketeers and you'd be forgiven for thinking DV editing was something you could do on a multimedia computer out of the box – and to a degree it can. Stick a FireWire card in a spare slot, start up the editing software and, as the promotional material goes, you can be capturing and editing in minutes.

FireWire? That's the more exciting name of IEEE 1394, a standard for transporting digital video data, usually between a DV camera and a computer. All DV cameras worth considering have FireWire output, and a few have inputs as well; newer Macs have FireWire output and input built in, as do some new PCs, and add-on cards are readily available for a ton or so.

Digital video is only ones and zeroes, so surely a computer can process digits no matter where they come from? But digital video is a couple of dozen million ones and zeroes every second. The chances are that even if your computer's processor is powerful enough (333MHz and upwards), the bus that shunts information from the graphics card to memory to disk and back again isn't. Added to that, if you buy an unbadged PC clone, its components probably won't have had the sort of reliability testing that brand makes have. (Loath as we are to recommend badged machines, component testing for cutting-edge applications is all these manufacturers have to sell. Macs, too, are always built to rigid specifications.)

Spending spree

There's a joke that the single most important card to get video working properly on your computer is your credit card. But these days, the video input you choose will depend as much on features as budget. The pick of the bunch have Sony's DV hardware chip on board, the simplest are unadorned sockets for the FireWire output of all DV cameras. Some are better at handling constant digital video throughput, others excel in capture and scene recognition software.

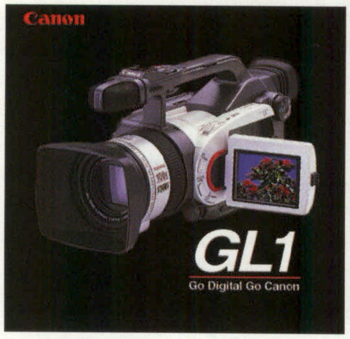
Editing software usually comes with a capture feature that hooks directly into the video card but, for best results, find a card that includes software that captures without involving the burden of other software. It's also important that the card can output as reliably as it can capture – there's no point making a world-beating movie if everyone has to come look at your computer to see it.

Most video card bundles come with a 'light' edition of one editing system or another. Adobe's *Premiere* is the most popular, but Ulead's *MediaStudio Pro* and In-Sync's *Speed Razor* have their devotees too. The latter is known for rock-solid output in the final stages. Apple has its own *Final Cut Pro* software out this year. Despite oohs and aahs at Macworld, it's far too early to know how this *QuickTime*-based software will fare.

Lastly, or firstly, you will need a camera. Prices are jumping around now that camera makers have realised professionals want the three-chip mini-DV cameras such as the Sony VX1000. Semi-professional cameras such as the Sony DSR range look great but are regarded by some in the business as big plastic boxes that contain mini-DV camera technology. In their defence, they do take the superior quality 'big' DV tapes and operate at a faster speed to reduce glitches in the image. One camera to look out for in coming months is the Canon GL1, a new sibling for Canon's popular XL1 that puts professional lenses within reach of consumer DV cameras.

The rest of this *Computer Arts Special* covers just about everything else you need to know about digital video. Running around the streets with a camcorder is one thing. You need to get every byte into your computer, cut it together like a pro, and run it out to a format you can be confident will take you places. Learn the basics of compression, editing, special effects, and output and you'll be ready to hit the world with what you've got ca>s

> ***"There's a joke that the most important card to get video working on your computer is your credit card. But these days your choice will depend as much on features as budget..."***



The Canon GL1, imminent successor to the extremely popular XL1.

Burn, Hollywood, burn?

Film is expensive. The average 35mm feature reel weighs in at around 20kg and it costs between 5 and 10 per cent of box office takings just to get prints to the cinemas. A camera kit can set you back a quarter of a million. But then film's so much better, right?

Video is a by-word for poor quality. Compensating for its short-comings was the driven purpose of the professional video industry. In order to minimise the quality losses that occur every time a copy is made or an effect added, editing studios grew into mammoth organisations to prevent quality drops and cover up the inadequacies of the video format.

Also in tow came dozens of new formats that producers and directors would reluctantly pay engineers to translate for them. All those bells and whistles had a price, leading to million-pound advertising fees and complimentary coffee at £1000 a cup.

Enter DV. Launched as a modest improvement on Hi-8, and very much for the consumer, none of the camcorder manufacturers foresaw the popularity of Sony's VX1000 among professionals. Within weeks, thousands were in use, shooting news footage, documentary fill-ins and even some mainstream programming. A £1000 camcorder that had inadvertently boasted comparable quality to Betacam was threatening Sony's £40,000 professional cameras. The economies that kept cameras, recorders, mixers and video effects in thousand-pound-an-hour studios were crumbling.

Anyone with a vested interest was quick to denigrate DV in the trade press, and the camera makers rushed out 'professional' standards such as DVCAM and DVCPRO – standards they hoped would redirect their bread-and-butter clients back to expensive kit. And the VX1000 more than doubled in price.

Since then, the camera business has been rushing toward high definition in an attempt to re-establish the segmentation of its markets. HDTV is extremely high quality, better some say than celluloid – although that's highly subjective. What isn't subjective is the fact that digital acquisition pushes all those film costs to one side. Low-cost, accessible equipment means low-cost digital distribution that will do for the movie business' inflated print-and-postal costs what desktop publishing did for magazines.

And even if digital isn't superior to film, it's better suited to the modern world. Cinemas that can change their schedules at the flick of a switch will be far more accessible to independent movie-makers who ordinarily struggle for a distribution deal.

In the US last year, the feature-length horror *The Last Broadcast* was shot on DV, edited on a PC, and broadcast via satellite to five mainstream cinemas. Other outlets are blossoming, too. Digital festivals such as Onedotzero are becoming a mainstay of the creative world, Web video is promised, and digital television will grow briskly, with a glut of new channels crying out for content.

DV and its eventual successor, HDTV, put movie-making within reach of all. Just as new equipment opened film-making to wild experimentation in the 60s, digital film-making will throw the doors open to all sorts of rubbish in the next decade – and let in a few of its own geniuses, too.

Is digital the death of traditional film? Just as new technology changed the face of cinema in the 60s, expect DV to herald a new era for film and video.

The 6th Day!

and on the 7th, the World was Perfect!

Join the largest software-test worldwide in digital video animation. MoviePack™ is the ultimate new tool for trimming, editing and adding titles to videos on your PC and then animating them with countless real 3D effects. No matter what the source, holiday films, music clips, TV trailers or streaming videos for the Internet, MoviePack™ does the job and features countless transitions, filters and effects. On top of that, the innovative, intuitive and easy to use program interface helps you to easily generate even the most complex animations.

Participation in this software-test (for a handling charge of £19.95 plus shipping) offers you valuable advantages. Join us now and let your ideas flow into the program's development. Additionally, you can save almost £500 when purchasing the release version.

Please fill in this coupon or phone our credit card/debit hotline on: Freecall 0500 223 660 or sign-up online at: www.aist.co.uk

SECURE ALL YOUR ADVANTAGES NOW AND GET READY TO FACE THE FUTURE OF DIGITAL VIDEO EDITING!

- No more waiting: MoviePack™ offers a totally scalable **REALTIME PREVIEW**
- **COUNTLESS** individually configurable **EFFECTS, FILTERS** and **TRANSITIONS**
- **COMPATIBLE** with all standard **EFFECTS/PLUG-INS**
- **INTUITIVE HANDLING**
- **PROFESSIONAL PERFORMANCE - INCREDIBLY LOW PRICE**

MOVIE PACK

WE LOOK FORWARD TO YOU JOINING US:

[www.aist.co.uk]

AIST

AIST UK • The Old School • Greenfield • Bedford • MK45 5DE • United Kingdom
Phone:+44 1525 713 671• Fax:+44 1525 713 716 • Email:sales@aist.co.uk• Internet:www.aist.co.uk

Please send this coupon in an envelope to:
AIST UK, The Old School, Greenfield,
Bedford, MK45 5DE, UK,
Fax: +44 1525 713 716

Yes,
I want to participate.

Date

Signature

MOVIE PACK
ORDER NOW!

I will pay the handling charge of £19.95 (plus £2 postage and packing) by:

(All prices include 17.5% VAT. Orders can only be accepted until the 31 Dec.1999)

○ American Express ○ Diners Club ○ Mastercard ○ VISA ○ Switch ○ ....

Card number:

Name on Card:

Expiry date:

○ Cheque (made payable to AIST UK)

Sender:

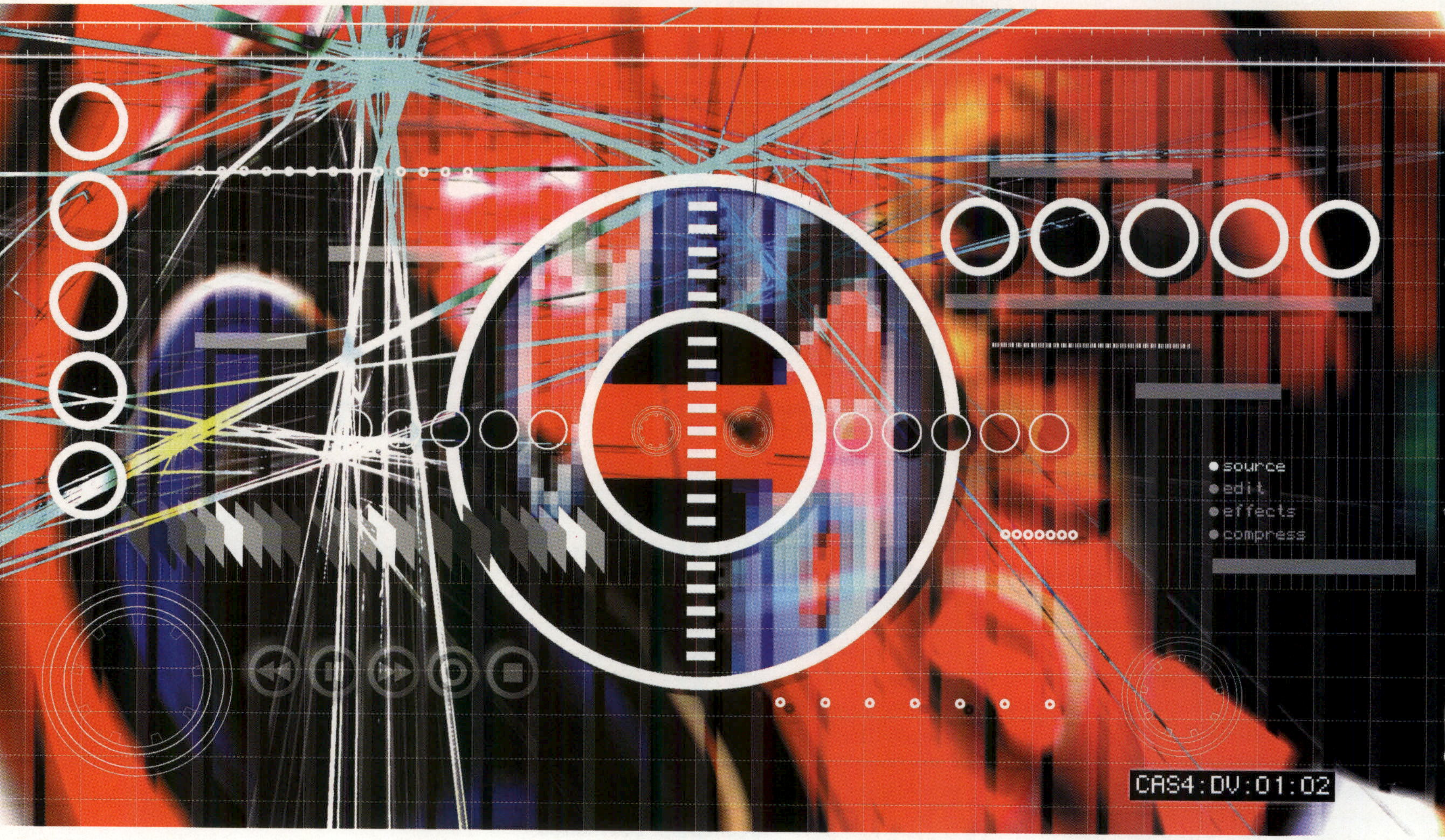
Street:

City/Code:

Country:

Telephone/Fax:

E-Mail:



[SOURCE] EDIT COMPRESS EFFECTS

First steps

FORMATS... CODECS... DV CAMCORDERS... SOFTWARE... SO MANY CHOICES TO MAKE, HOW DO YOU START? BY HAVING A DAMNED GOOD THINK, THAT'S HOW...

As the saying goes, the best thing about standards is that everyone can have one. In the video world, using standards means either filling your shelves with a dozen books the size of a phone directories, or experimenting until you find something that works, and sticking with it.

The first question to ask yourself is whether your computer is actually capable of playing the kind of quality video you want. Do you have all the hardware and software you need? Are your components sufficiently powerful and fast to cope? And, importantly, are they set up properly?

The best way by far to test this is to get your hands on a DVD player and plug it in. DVD is the definitive video output standard, because it is how we'll be watching videos in the future. The quality of the format is incredibly high – it has been built to withstand the demands of posterity – and even if it won't last far into the next century, it's a great way to see what your computer is capable of now.

But this is an expensive way to go if you don't actually want a DVD player in the first place, and if none of your friends and colleagues have one you can borrow. Another way of testing your playback display is to start a VCR plugged into your capture card, then start your capture program and maximise it to full-screen. Depending on the software you use, what you see should give a fairly good indication of the quality you can expect your computer to provide in DV.

Aiming for quality

Once you're sure you know the sort of quality you can expect of your computer, the second issue is how to capture. Knowing the value of all your inputs is critical to understanding why your output is the quality it is.

Often overlooked is the material you shoot. Zooming, panning and flashing lights are all extremely tough on computer processing power. By contrast, stationary monochrome pictures guarantee much better quality, even if they are a little boring. If you have the option of shooting your own footage, experiment a lot with what digitises best before committing to one tape format or type of shot.

Tape formats themselves are varied. Film has changed little in 100 years. Videotape has changed no less than 20 times in a couple of decades. What we have now is a fairly delineated list of formats. VHS is the cheapest; Betacam SP is the most expensive. And in this game money buys quality.

The gap between professional and consumer formats is not as straightforward as it once was. Those big wheely cameras on the Blue Peter studio floor are now complemented with hand-held DV cameras that retail for less than £1000. Very often a commercial documentary will mix Betacam and DV in a single sequence with barely any difference in quality.

The popular half-inch VHS cassette has taken over the consumer market place, and in a four-head VCR is still a very workable format for basic shooting. However, for professional use it is practically unusable. Every edit and video effect affects the recorded quality and, not being high, it will suffer as a result. In this age of desktop digital editing, a 10 per cent loss per generation is unforgivable.

In the professional world, Super VHS (S-VHS) and its compact version, S-VHS-C, were used for a while as an easier-to-operate acquisition format to be copied to higher quality formats for editing. S-VHS was introduced to compete with the 8mm tape format (a size chosen as much for the perceived popularity of 8mm film home movies as for the compact size).

By comparison, VHS camcorders were bulky, and 8mm formats, with similar quality, quickly took the lead. When Sony introduced its Hi-8 format the quality was as good as S-VHS, tolerable for mainstream television, albeit with a fly-on-the-wall quality. Sony's latest 8mm format, Digital-8, upped the quality again, but by that time digital video was all the rage.

The pro selection

Betacam is the choice of professionals. No question. It runs six times faster than Betamax, records luminance and chrominance as two separate tracks, and stores the two colour difference signals as a single compressed track. Digital Betacam (DigiBeta) uses similar half-inch tapes, records the same number of tracks, and is pristine. The next variant, Betacam SX, is better yet. It is capable of accelerating recording and playback, so is ideal for news gatherers as it can be shunted into an editing system at four times real-time speed.

The digital Betacam formats are the benchmarks that DV would love to hit. Using immense compression techniques, consumer DV squashes the equivalent of a 3.5-inch floppy disk onto every 5mm of tape. DV runs at 5:1 compression (the data is compressed to 20 per cent of its original), meaning that its quality will never equal uncompressed standards such as DigiBeta.

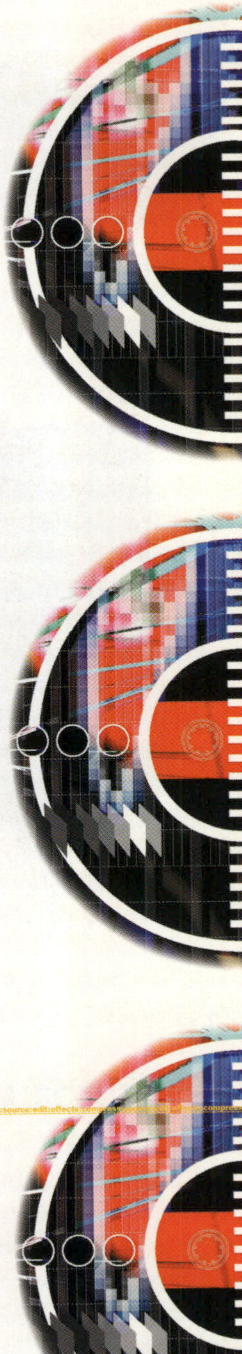
Professional variants of DV come from two of the leaders in the field: Sony and Panasonic. Predictably, they chose different standards, although this isn't a disaster. Panasonic's camera will play Sony's DVCAM tapes as well as its own DVCPRO.

Those who take these cameras apart report that the only real difference between the professional standards and three-chip consumer DV is the bigger box. Some cameramen will disagree, depending on what you want to shoot. (Even professional formats will show artefacts around a blue-screened subject, although Panasonic's DVCPRO-50 is reportedly good enough to rival the top broadcast standard, Digital S.) Professional DV also doubles the speed of the tape, which reduces the number of drop-outs – a common hair-puller for those relying on consumer DV for acquisition.

> ***"Those who take these cameras apart report that the only real difference between the professional standards and three-chip consumer DV is the bigger box..."***

Once you've decided on your camera and gathered your footage, you will need to get it into the editing computer. On the whole, the more information you can give it, the better. Component video output uses a cable each for red, green and blue signals, plus a fourth cable to synchronise the others. S-Video uses two cables, one for luminance and one for chrominance (brightness and colour to normal people). Composite uses just one cable combining all the information into one signal.

As is true for this whole article, give the final edit as much quality and as many pieces of information as you can. It only takes one weak link to bring the whole quality down.



Using a digital video camera

A FEW POUNDS SHORT OF A GEORGE LUCAS-SIZED BUDGET TO PLAY WITH? WORRY NOT – OUR GUIDE TO BUYING AND USING A DIGITAL VIDEO CAMCORDER PUTS THE FORCE FIRMLY WITH YOU...

[TUTORIAL] SOURCE EDIT COMPRESS EFFECTS

If you're considering entering the digital realm, then you're in good company: rumours are rife that the next *Star Wars* will be shot entirely in digital, with not a strip of celluloid in sight. So why would Hollywood want to go digital?

The digital dream

Movies like *Star Wars* are making increasing use of computer generated special effects, which needs to be integrated with 'real world' footage. So increasingly it makes sense from technical, aesthetic and financial viewpoints to originate everything digitally. This way, digital post production, effects and editing become a seamless operation with benefits in time, cost and image quality.

The good news for aspiring new Lucases is that the cost of emerging digital video technologies is tumbling fast. A whole crop of DV consumer and prosumer video camcorders have recently bounced onto the high street with prices in the hundreds rather than the thousands. Add to this equation the speed, power and price of a modern desktop PC, multiply its capabilities with an equally powerful and affordable video capture card – and suddenly you can compete with the guys from Industrial Light and Magic. Okay, not quite, but...

Think first, buy later

So what should you look out for in digicam? To be honest, there are no hard and fast rules. Consumer-level DV cameras haven't been on the market long enough to show up any real clangers, and most in the sub-£1000 bracket sport very similar features. But it's worth arranging an in-store demo of the camera that tickles your fancy. Look out for things like battery life and SP/LP playback. Most models in this range have gimmicky features – built in mosaic effects and the like. Just remember, they're only gimmicks.

Of more use are features like low-light capability, manual/auto shutter override and image stabilisation, which eliminates some camera shake on hand-held shots. You can also use some models for stills, capturing a static DV image into your footage.

In the undesirable category, watch out for over-fiddly controls and poor or awkward viewfinders. It's also worth checking the playback for sound. Several models have on-board microphones that are so sensitive, they can pick up the sound of the tape mechanism under quiet conditions.

You should also check the terms and conditions of the warranty. In particular, DV cameras' heads rotate much faster than in ordinary camcorders, increasing wear and tear on a delicate and expensive item. Cases have been reported of DV heads needing replacement within sixty hours of use, so a good warranty is a must.

Figure it out

Once you've forked out for a camera, the important thing is to use it! Familiarise yourself with all the controls and settings, then just have fun before you get into anything serious. The great thing about many DV cameras is their compact size, enabling you to try out shots and compositions that would at best be difficult with a bulkier camera.

DV cameras across the board offer two main advantages over their traditional, analogue cousins. First, the image at the capture stage is (usually) superior in quality, in resolution at least. The second, and more important, advantage is that your DV camera captures the image, well, digitally. The real benefit comes when you're copying and editing your footage. Analogue picture quality quickly degenerates with every copy; so much so that to all intents and purposes, anything beyond a second generation copy is unwatchable. With DV, on the other hand, it's possible to transfer and edit your footage umpteen times without noticeable degradation.

> ***"It's worth pointing out that you don't have to use a FireWire capture card with your DV camera. But the point is that this requires conversion of the digital signal to analogue..."***

What else do you need?

To do this, however, you need to be able to transfer your footage from your DV camera to your other equipment, and all in digital format. This demands a special video capture card – in the case of DV camcorders, one that uses the IEEE 1394 standard, better known as FireWire. FireWire was developed specifically for shunting around large chunks of data at high speed, and is ideal for the medium of digital video.

But unless you have a blue G3, or bought a new PC yesterday, it's unlikely that you'll have a FireWire interface as standard – so you'll have to fork out for one. Check out the guide on page 15.

It's worth pointing out that you don't have to use a FireWire capture card with your DV camera, since most also support an alternative form of output, such as S-Video, through which you could transfer your DV footage directly to VHS or S-VHS tape, say. But the point is that using this type of output involves converting the digital signal to analogue, with a subsequent loss of quality. The aim is to keep everything in digital format right through the production and post production process, and FireWire cards enable you to achieve this. (Incidentally, a new FireWire standard, FireWire 2, is due shortly. It promises even higher data transfer rates, better compression ratios and so on.)

Like this JVC model, digicams don't need to be big and bulky. In fact, when you're out shopping you should consider putting comfort of use near the top of your agenda.

Unlimited HD?

Speaking of compression, all your moving pixels will quickly add up to an awful lot of megabytes. Approximately 1.6GB per minute of uncompressed video, in fact. Even FireWire 2 will have trouble shifting that amount of data. And even if it can, you'll find yourself filling even the largest hard disk in no time at all.

Various solutions to the problem have been developed, in the form of codecs. A codec (which stands for COmpression, DECompression) compresses your video on capturing and then decompresses it on playback.

There are almost as many codecs as there are capture cards. Some are hardware based and only work with a particular card-camera configuration. Others are software based and work with almost any system.

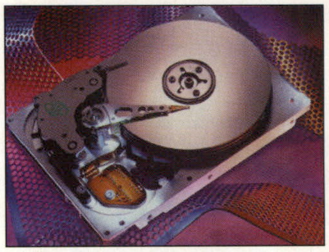
The important thing to be aware of is whether the codec you are using is lossless or lossy. To simplify greatly, a lossy codec achieves its compression by throwing away 'unnecessary' pixel information – with a resulting loss in image quality. Lossless codecs, on the other hand, look for the differences between each frame of video and then save these. Each type has its relative merits and advantages, but if final image quality is your overriding concern then invariably you want to use the lossless type, where possible.

Finally, no matter how efficient your compression codec, once you start playing with DV you're going to have large files floating around. Plenty of storage is a must. In addition, when you're capturing video or outputting your final edit to tape, it's important that your hard drive can keep up a healthy flow of data, to avoid dropping frames. In short you need a big, fast hard drive, at least 6GB and preferably A/V rated. This refers to drives designed specifically for audio-visual use. But as usual, it also means you have to pay more for it...

Top tips for shooting DV

Here are some basics, and you'll find more tips throughout the rest of the *DV Special*...

- Use a tripod. Your audience will welcome steady shots, and they're much more suitable for most compression codecs to handle.
- Shoot plenty of buffer zone at the beginning and end of your shots, by rolling the camera before and after the material you want to shoot. It'll make life much easier when you get to the editing phase. And be sure to get plenty of cutaway shots.
- Learn about lighting, and remember to light your scenes well – not too bright or high contrast, nor too low. Contrast and low-level graininess do not compress well.
- Avoid elaborate transitions in the editing phase. Cuts and simple wipes are the best transitions to use for material to be compressed. Fancy digital effects like page curls and so on are difficult to process, and will end up looking pixelated.



Consider your compression – you'll need *plenty* of hard drive space.

- Don't over-compress your video, running through some kind of compression-decompression scheme. Artefacts, or unwanted visual glitches, are invariably added each time you pass your video through a codec.
- If your budget permits, procure a separate DV source material VCR for your non-linear video editing setup. By doing this, you can reduce the wear and tear on your DV camcorder.

Using a video capture card

Shooting footage is just the beginning of your digital journey. Now you want to *do things* with it, which means transferring 24 images for every second of video into your computer...

The miroVIDEO DV200 offers excellent image quality and total control over your camcorder. It costs £469.

[TUTORIAL]

The beauty of DV is that you can keep the entire production pipeline in the digital realm, and with the right combination of hardware and software, your PC becomes a powerful desktop studio.

The first stage in DV post-production is to transfer video footage from the source tape onto your computer, a process normally referred to as digitising, and requiring the services of a video capture card.

Actually, digitising is only necessary if you don't have the necessary FireWire equipment (a suitable camera and interface card) – remember, with FireWire the data is digital to begin. But from an analog camcorder – the old type, with a VHS or S-VHS output, but no FireWire – your capture card has to turn the data into bits and bytes, which immediately means loss of quality. The implication is clear: it's better in every way to have a FireWire-capable camera and interface card, if you can afford it.

There are over a dozen popular makes of card available, offering varying degrees of sophistication and at prices to suit most pockets. For under £100 you can get a basic capture card enabling you to grab reasonable quality video, which you can then be edit with other software.

Be aware, however, that cheaper cards don't always capture sound. Doing it separately, usually through your sound card, can lead to frustrating syncing problems later on. Cheaper cards also sometimes lack an output jack for transferring your finished film back out to tape, and the capability to capture/playback full screen. Finally, look out for a monitor option so you can see what you're capturing as you do it – sounds basic, but again, it's not always present.

What you pay for...

Generally speaking, as the price increases, you get a card which captures and outputs at better quality. The improvements are noticeable in terms of image quality, dropped frames (less of them), size, playback rate and compression. All cards support a codec to compress the video to a reasonable size on both capture and playback. And some cards offer you a choice of codecs, which give better results depending on the kind of footage you're working with.

The numbers to look out for are the compression ratios: the lower the number the better. A video captured at a compression ratio of 2:1 will, broadly speaking, be indistinguishable from the original. Anything under 4.25:1 is considered okay in the broadcast arena. Some codecs can be as efficient as 100:1 and still give good results, as well as much smaller file sizes. However, since you're going to be editing the video later and then outputting it again (probably with another codec), it's best to use the lowest compression rate you can afford in storage terms – or ideally, none at all.

Bundle benefits

Most cards over the £100 mark include some sort of editing software as a bundled package. These are usually 'light' versions of popular video editing packages such as Adobe *Premiere*. The more expensive cards usually bundle the full software, and/or the manufacturer's own editing package. Cards at the pricier end of the spectrum often incorporate overlay, or genlocking features, which enable you to easily use chromakey and titling effects over your source footage.

The intricate combination of hardware and software at play in a video capture set up is quite a complex equation. If you are hoping to do serious video work, or use the system to make your living, it may even be worth approaching a specialist to put together a custom solution designed to suit your needs. It's true you can save money by buying off-the-peg cards and software to fit into your existing system, but in the long run that's more trouble than it's worth.

On the other hand, if you're just into DV to have fun, or learn some tricks of the trade, then there's a wide enough selection of low- to mid-priced cards available for both Mac and PC users to just dive in and go for it.

computer arts special
The definitive guide to digital video • Mac & PC
cas04

hardware buyer's guide

Welcome to the best and definitive guide to digital video hardware

The buyer's guide is a whistle-stop tour of the very latest hardware releases for the digital video market. If you want definitive answers to all your hardware queries, here's where to start...

Below £500

XLR8 Interview

Mac only
£116
Interex UK
t *01923 263 108*
w *www.interex.com*

Designed for iMac users, Interview is a simple product that enables you to digitise full or half-screen video through the Mac's USB port. The hardware is a small dongle-like unit that plugs into your USB port, and you can then plug an S-VHS or Composite video source into it (such as your camcorder or VCR). As you'd expect, the quality isn't wild, considering a USB port can only transfer 1.2MB-per-second tops, but it's more than good enough for posting to the Web. Unfortunately, you can't record back to tape after editing.

Bundled with Interview is Strata's powerful video editing package, *VideoShop 4.5*. V5 is due out any day now, and the bundle includes an upgrade offer. Interex UK is hoping to offer a *Premiere LE* bundle in the near future too; plus, for an extra £24, you can get a USB PCI card bundled with Interview, so you can use it on older non-USB PCI PowerMacs.

ATI All-in-Wonder 128

PC only
£159
ATI
t *01628 533 115*
w *www.atitech.com*

The All-in-Wonder does for the PC what the Xclaim VR 128 does for the Mac. It's available in either PCI or AGP flavours, and is based around a Rage 128 GL graphics processor with 16MB of VRAM. It can support resolutions up to 1920x1200 in 24-bit colour, accelerates OpenGL and DirectX APIs, and even accelerates DVD playback.

What else? Well, the video options are extensive. The All-in-Wonder can capture and output full-screen video at up to 30-frames-per-second (depending on host PC specifications), and comes with Digital VCR real-time compression software which enables you to use your PC as a VCR, recording complete shows or even films (provided you have the disk space). The card further captures in either MPEG-1 or 2 formats, and you can then play back your recorded video to a TV or video. A 125-channel TV tuner with instant replay and zoom function is also included.

Plus, with a suitable camcorder and third-party software, you can also use the All-in-Wonder as a video conferencing solution.

All-in-Wonder 128
The ultimate all-in-one TV, video and graphics card
16 MB
ATI
Intelligent TV-Tuner with Digital video recording
128-bit 3D graphics acceleration
True color (32-bit) gaming
Video-out
MPEG-2* video capture & playback
Hardware DVD video playback
AGP BUS
INSIDE
Features MPEG-2 Real-time capturing!*
rage 128

While the ATI All-in-Wonder may be getting on in terms of being a graphics card, as a digital video card it's still a force to be reckoned with. If you're on a budget it provides just about everything you could need, with ease of use and some handy software.

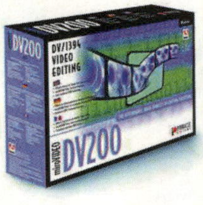
miro Studio DC10Plus

PC only
£199
Pinnacle Systems
t *01895 424 228*
w *www.pinnaclesys.com*

The DC10Plus is a Motion-JPEG PCI capture board capable of handling 6MB of video per second. It can capture full-screen NTSC or PAL at up to 25-frames-per-second, and includes a rendering engine for accelerated playback of captured video. The card comes with one S-VHS input and one Composite input for connecting a range of video sources, and includes full sound support. After editing your video, you can burn it on a CD-R (not supplied) or simply output it back to video tape.

Included in the package is Pinnacle's own *Studio* editing software, an easy to use package for the novice. You also get *TitleDeko* for adding titles to your movies, and this includes special effects such as metallics and neons. Finally, using *SmartSound*, you can even add your own custom soundtrack. The DC10Plus is an excellent bundle for the home user, and offers more than enough to be useful for the Web designer.

While not as capable as professional, high-end software, the *Studio* software supplied with the DC10Plus is adequate.



As an entry-level FireWire card the DV200 from Pinnacle is a good buy.

miroVideo DV200

PC only
£449
Pinnacle Systems
t *01895 424 228*
w *www.pinnaclesys.com*

The miroVideo DV200 is Pinnacle's version of EditDV, Digital Origin's FireWire video-editing solution. What you get is a two-channel FireWire card that enables you to plug digital video cameras with FireWire ports into your PC. You can then download, edit and upload video back to the camera without loss of quality. You can also connect devices such as FireWire hard drives, which are substantially cheaper than their SCSI counterparts, yet offer similar transfer rates.

The DV200 package includes *Premiere LE* for editing and titling your videos, and comes with a miro *Instant* plug-in for acquiring DV clips from your camera. A copy of *Photoshop LE* is also included for editing stills, along with miro *DV Tools*, which enables you to store and index your clips, control your DV camera, and record from your PC back onto tape.

Like any FireWire DV solution, the DV200's image quality is limited only by the DV camera you use with it. It's possible to get true broadcast-quality results from this remarkably cheap DV solution. And for £821, you can get a version that comes with *Premiere 5.1*, plus an on-board SCSI controller.

Between £500 and £1500

AV Master 2000

PC only
£499
FAST Multimedia
t *0181 968 0411*
w *www.fast-multimedia.com*

Although not a DV card as such – it has no FireWire inputs – the AV Master 2000 is a superb mid-range card for digitising analogue video. The hardware features a video input (CVBS, S-Video), two video outputs, one audio input and output (no need to use a separate sound card), plus M-JPEG digitising. Handily, the software provided is a full version of Ulead's excellent *MediaStudio Pro 5.2*, along with *Cool 3D* (for titling) and Matchware *Mediator 5* – though you can use any other software if you like.

Quality is good, with both NTSC and PAL supported for full-screen capture and overlay in true colour. In short, the AV Master 2000 gives pretty much the best deal you're going to get using a purely analogue digitising card. It may well be worth spending that little bit extra if features, speed and reliability are important to you.

EditDV

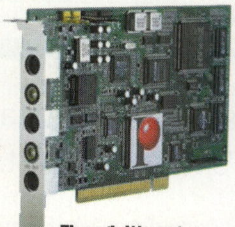
PC and Mac
£704
Computers Unlimited
t *0181 358 5857*
w *www.digitalorigin.com*

Radius, now known as Digital Origin, was the first company to ship a FireWire DV solution, and it's been much copied since. EditDV consists of MotoDV – a FireWire card and capture software for use with your DV camcorder, and the *EditDV* editing software. A version without the FireWire card is available for the new G3 Macs, which come ready-equipped with FireWire.

If your PC or Mac doesn't have FireWire, simply bung in a MotoDV FireWire card, install the drivers, and off you go. You can now link to any FireWire-savvy digital camcorder, download video in real-time, edit it and – depending on your camera – send the edited version back again. The *EditDV* software is fully featured and offers timeline-based editing, special effects filters and transitions, plus support for Adobe *After Effects* plug-ins. Compared to Pinnacle's DV200 system, the EditDV is a little more expensive, but the *EditDV* software is outstanding.

miroVideo DC30 Plus

PC only
£699
Pinnacle Systems
t *01895 424 228*
w *www.pinnaclesys.com*



Though it's not a DV card the miroVideo DC30 is a solid mid-range analogue digitiser.

The miroVideo DC30 Plus is a mid-range analogue digitiser card aimed at the multimedia developer. It can digitise full-screen, full-motion video at close to Betacam SP quality, at up to 30-frames-per-second, transferring 7MB-a-second to disk. The DC30 Plus supports NTSC and PAL formats, and is compatible with S-VHS, Hi 8, VHS and Video-8 video systems. The card itself has composite and S-VHS input and outputs along with CD quality 44KHz, 16-bit sound.

With the DC30 Plus you get a full copy of Adobe *Premiere*, plus *Video SpiceRack* from Pixlan, which expands your video effects library by over 300 filters. *TitleDeko* software enables you to add professional-looking titles with a range of different effects to your video. Plus, *Photoshop 5.0 LE* is also included in the package, as is *Video For Windows* software.

Canon's DM-MV1 camcorder has been eclipsed somewhat by newer models, but it's still a damn fine camera.

Canon DM-MV1

PC and Mac
£1499
Canon
t *0181 459 1266*
w *www.canon.co.uk*

The MV1's been around for a couple of years now, and was one of the first digital video cameras with a FireWire interface to come to market. The MV1 can output digital video via the FireWire port, but video input is disabled (for a complex and rather ridiculous reason which we won't go into here). The camera itself features a progressive scan CCD that can capture in three modes: normal video, digital still, and frame movie mode. The latter further enables the camera to take 30 still images per second, so you're guaranteed not to miss any of the action.

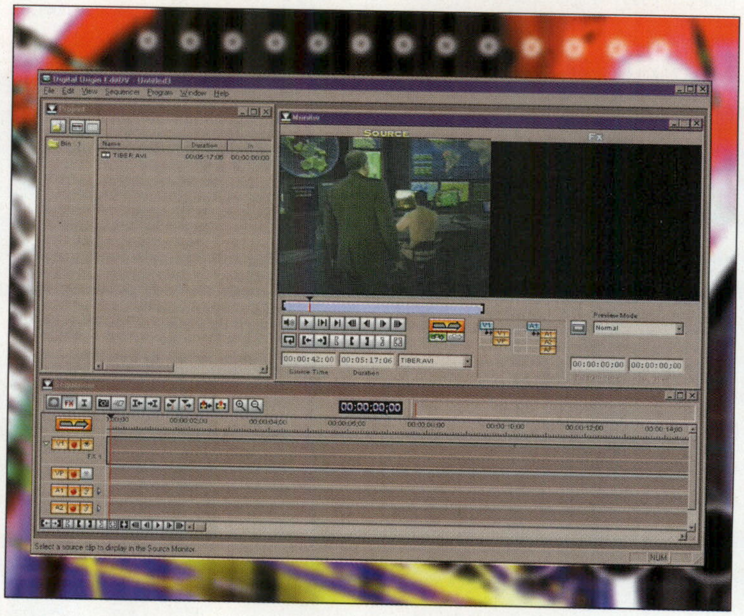
The MV1 records to standard DV tape, and comes with S-Video and Composite output ports (in additional to the FireWire terminal). This means you can hook it up to any television or VCR, as you would a normal camcorder. A stereo microphone is built-in too, and there are ports for an external microphone and headphones. An LCD screen is provided for framing and reviewing your footage, which is adjustable through 100-degrees. The MV1 also has built-in fades and wipes, which you can apply while recording. Simply fade out of one shot and into another at the touch of a button.

Sony DCR-TRV 510

PC and Mac
£1050
Sony
t *0990 111 999*
w *www.sony.co.uk*

The TRV 510 is a lightweight digital video camera with a storming 20x optical zoom and incredible 360x digital zoom. Built-in SteadyShot image stabilisation ensures your films are rock solid, even from hand-held, and it features NightShot infrared for shooting in low light conditions. In fact, you can take images in complete darkness (0 Lux) from as much as 10ft away. The 510 features Sony's Digital 8 recording system and has S-Video, composite and FireWire video outputs, along with 16-bit stereo sound. The 510's CCD has 480,000-pixels, and can take still shots as well as video, stored in 2MB of internal memory. Plus, the TRV 510 has footage in widescreen 16:9 ratio. A 4-inch LCD display enables you to line up and review your shots, and the 10-hour, lithium-ion battery means you can go on filming all day.

German company FAST Multimedia has been producing quality video capture cards for a long while now and the AV Master 2000 is one of the best, at least in terms of analogue cards. Think carefully before buying any non-FireWire capable card, though.


Digital Origin EditDV - [Untitled]
File Edit View Sequence Program Window Help
Monitor
Source
FX
Name
Duration
TIBER.AVI
Preview Mode
Normal
00:00:00;00
Select a source clip to display in the Source Monitor
NUM

EditDV is relatively new for the PC but the Mac version has been around for a while. It's a complete solution: a FIreWire input/output card (called MotoDV, for some reason) and this custom software, *EditDV* – a very capable package which justifies the price.

£1500 and up

Canon XL1

PC and Mac
£2999
Canon
t *0181 459 1266*
w *www.canon.co.uk*

Canon's XL1 is aimed at the semi-professional who needs near-Betacam SP quality, with rugged design for demanding environments. It's perfect for multimedia professionals, and has an interchangeable lens system with built-in image stabilisation. The lens that comes with the XL1 is a 16x optical zoom and 32x digital zoom, which is interchangeable with a range of lenses available from Canon.

The resolution of the XL1 goes beyond most DV cameras (600 lines instead of 530), and uses no less than three CCDs – that's one for each colour component – for maximum definition. It also uses Pixel Shift technology to increase the dynamic range of the CCD array. This produces sharper images and more sensitivity in low-level light conditions.

A favourite feature with XL1 fans is the Frame Movie mode. This shoots 30 consecutive still pictures per second, rather than the usual 60 fields per second of interlaced video. This might not sound like much, but the resultant footage is much more 'film-like'. This is unsurprising, since it actually mirrors traditional film mechanics.

Sony DCR-VX1000E

PC and Mac
£3000
Sony
t *0990 111 999*
w *www.sony.co.uk*

The VX1000 is the model that pretty much kicked off the consumer digital video revolution – in the US, at any rate. Originally released for around $1000, Sony had no idea just how good the machine actually was, until a fanatical fanbase appeared and broadcast-quality films made with it started popping up. At this point, the company promptly upped the price to maintain the traditionally huge gap between 'consumer' and outrageously expensive 'professional' gear. Bah.

Make no mistake, the VX1000 is still an excellent buy, offering broadcast-quality results. It uses a three-CCD system for superb optical quality, offers 10x optical and 20x digital variable zoom, and uses Mini DV cassettes. Along with the usual Full Auto modes, there are manual focus and exposure controls plus a Super Steady Shot mode for minimising camera shake. A Photo mode can also record up to 510 still shots, while timecode and extended data codes help later on with editing. Oh, and needless to say, there's an IEEE 1394 DV output – FireWire.

Media 100 xr

Mac only
£13,995
Media 100
t *01344 411 001*
w *www.media100.com*

The Media 100 xr system is designed to capture and edit full-screen, full-motion video at broadcast quality. Combined with Adobe *Premiere* software (supplied), it gives you a full off-line editing suite. The system is based around the Vincent card, which can handle a sustained throughput of a whopping 24MB per second real-time audio and video.

The Media 100 works in any Mac faster than a 9500/150. It's designed to do so with an UltraSCSI card (such as Adaptec's 2940U) that has an UltraSCSI hard drive array and a powerful graphics card – such as the ATI RAGE 128, which ships with new PowerMac G3s.

The Vincent card not only captures and compresses audio and video in real-time, but also accelerates playback and *Premiere* filters. In fact, combined with Apple's PowerMac G3/450 (which comes with UltraSCSI card and hard drive), the Media 100 xr offers a broadcast-quality editing system at a low price.

DV Master Pro

PC only
£2226
Fast Multimedia
t *0181 968 0411*
w *www.fast-multimedia.com*

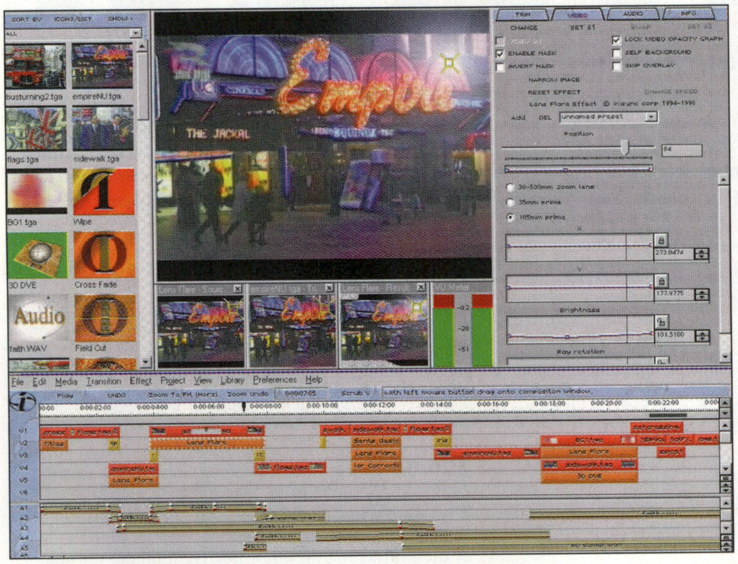
Along with Pinnacle Systems, FAST Multimedia offers a wide range of excellent PC products, from home-user to extremely high-end. DV Master Pro is definitely in the latter category, as you may guess from this price, but it offers a serious alternative to some of the even more expensive offerings here.

It's designed for NT 4.0, and is based around the popular *Speed Razor DV* package from In-Sync. Here, FAST has customised *Speed Razor* for the hardware, up to v4.7.

The board itself features a whole host of options: two FireWire ports, video and audio in and out, DV device control via FireWire, a breakout box for analogue devices, including S-VHS and Hi 8 (with both input and output for audio and video), and so on. It's compatible with nearly all Sony DV devices, and works to some extent with other makes too.

Meanwhile, *Speed Razor* offers real-time playback, optimised rendering plus unlimited video and audio tracks; also advanced trim functions, over 50 effects, a huge number of transitions, and just about everything you could want from a video editor. If you're serious about DV but can't stretch to the likes of Avid, the DV Master Pro is for you. **ca▸s**

Much lauded by semi-professional filmmakers (and even in use at the BBC), Canon's superlative XL1 camcorder is a benchmark model. Even at £3000 it's a steal.


Empire
File Edit Media Transition Effect Project View Library Preferences Help

***Speed Razor DV* is an editing package that has been gaining momentum (and fans) steadily for a while now. It's known for rock-solid rendering, a plethora of effects and customisability; the version bundled with the DV Master has been customised to 4.7.**

Currently one of FAST Multimedia's flagship products, DV Master Pro is an expensive (though not in pro terms) but hugely capable DV card, complete with two FireWire ports, a breakout box for analogue devices, and a customised version of *Speed Razor*.

Win a DV camcorder

WIN A SUPERB MV200 DIGITAL VIDEO CAMCORDER – WORTH £800 – COURTESY OF CANON

Great digital video starts with that essential component, a great camcorder – and when it comes to photography, Canon really knows its stuff. The Canon MV200 is a fully-featured, compact and ergonomic digital camcorder that uses tiny, industry-standard Mini DV tapes – giving you all of the advantages of digital video without the bulkiness of larger formats.

The MV200 features a 16x optical zoom plus a superb 320x digital zoom, enabling you to narrow in on the tiniest of details with the full quality of Canon's world-renowned lenses. The built-in Optical Image Stabilisation (OIS) system automatically compensates for camera shake, steadying the image as you're recording, even at high zoom levels.

As well as the foolproof Full Auto mode, the MV200 has filming modes to suit every occasion: Auto, Active Frame (for FlexiZone focusing), Sports, Portrait, Spotlight, Sand & Snow and Low Light, all using the 64-zone light-metering system. Full manual focus is also possible, with the 2.5-inch LCD colour monitor displaying exactly what you're recording at all times (it can also be used to review recordings).

Throw in better-than-CD-quality stereo sound, a FireWire output terminal, a built-in editor, seven digital effect modes and a weight of just 720g and you're looking at one desirable camcorder. Worth £800, we've got one to give away entirely free to the first correct answer out of the hat. Fancy that?

The competition

The MV200 features a nifty system called OIS which aids your filming. But what does that stand for?

A – Optical Image Stabilisation
B – Original Interesting Shots
C – Only Important Scenery

To enter

Try the easy way via the Web:

1) Insert the Digital Video Special CD
2) On the Contents screen, click 'Current Compo'
3) Put 'Canon Camcorder' as the competition name, fill in the rest of the form and click 'Submit Entry'.

Alternatively, if you don't have Web access you can submit your entry on a postcard to:
Canon Camcorder competition
Computer Arts Specials, Future Publishing,
29 Monmouth Street, Bath, BA1 2DL.

Please remember to include your address and a daytime telephone number if possible.

The rules

Closing date for all entries is 31st October 1999. Employees of Future Publishing, Canon, their agents, or their families may not enter. No multiple entries will be accepted. The editor's decision is final, there are no cash prize alternatives, and no other correspondence will be entered into.

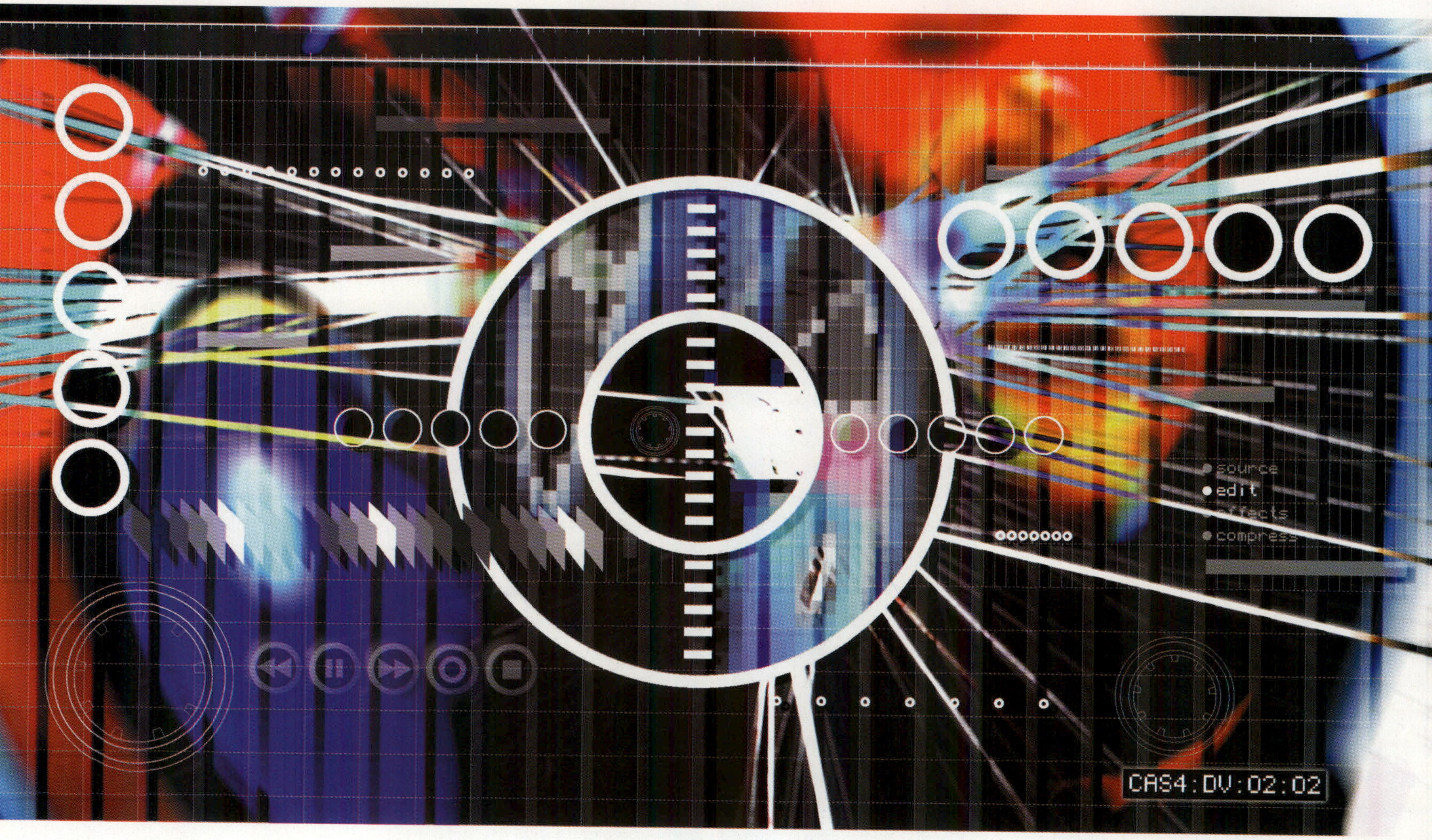
It's all about time....

Finding the right image needn't be time consuming. You have complete access to one of the most visually impressive european image collections online at anytime.

Visit www.stockbyte.com to search, buy and download single images in a matter of minutes without clocking up those extra hours in the studio.

STOCKbyte™
ROYALTY-FREE PHOTOS

www.stockbyte.com Freephone: 0800 909190



[EDIT]

Digital editing

EDITING FOOTAGE CAN BE THE MOST TIME-CONSUMING ASPECT OF YOUR PROJECT, BUT IT'S ALSO PROBABLY THE MOST IMPORTANT. HERE ARE THE GROUND RULES...

The advantages of using a computer and timeline-based editing software are all too obvious. Previously, editing demanded cutting pieces of tape or film and gluing them together. With computers, the footage is digitised and spliced together virtually.

But the advantages can quickly turn into a nightmare. Ask any editor what the greatest headache is, and they'll tell you it's choice. Producers and directors can now make tiny changes or have several combinations of the same footage just to see what it looks like. For many, it seems as if the editing rule book has been thrown out.

But the rules are essential if you don't want to get caught in editing hell – making minuscule changes that ignore the way we like to watch moving pictures. Learn the rules when you're young so you have the strength to break them when you're older.

From camera to HD

When you buy a video card, you'll almost certainly get a 'light edition' of one of the popular editing programs, probably *Premiere* or maybe *Speed Razor* or *MediaStudio Pro*. Each has its followers, but *Premiere* is by far the

> ***"Watch similar pieces made by other people, asking yourself at every cut why it was done there and what effect it had on you..."***

favourite, dominant among enthusiasts and growing in the professional world.

Digitising with software is often a simple matter, as long as your card is installed properly. Your editing program will have a Capture function that hooks into the card's video socket and redirects video to a digitised file. Whether you capture individual scenes as separate files or the whole shebang as one will depend on your disk space. The chances are that you'll have to log everything first and digitise the best clips individually – check out the 'Step by step' box, right.

Telling tales

Once you have your footage digitised onto your computer, you're faced with the arduous task of assembling it all into a meaningful story. The simplest form is known as the assembly edit, or deck-to-deck edit. This involves placing the best take of each section of your script one after the other on the timeline. Avoid being sidetracked and don't get hung up with effects, transitions or how pretty it looks until you've reached the end.

When you have a rough cut – a single concurrent edit that tells the broad strokes of the story you want – you can get into the finery of editing. This is where you use two track to fade and switch between subjects depending on the fine points of what you want to say.

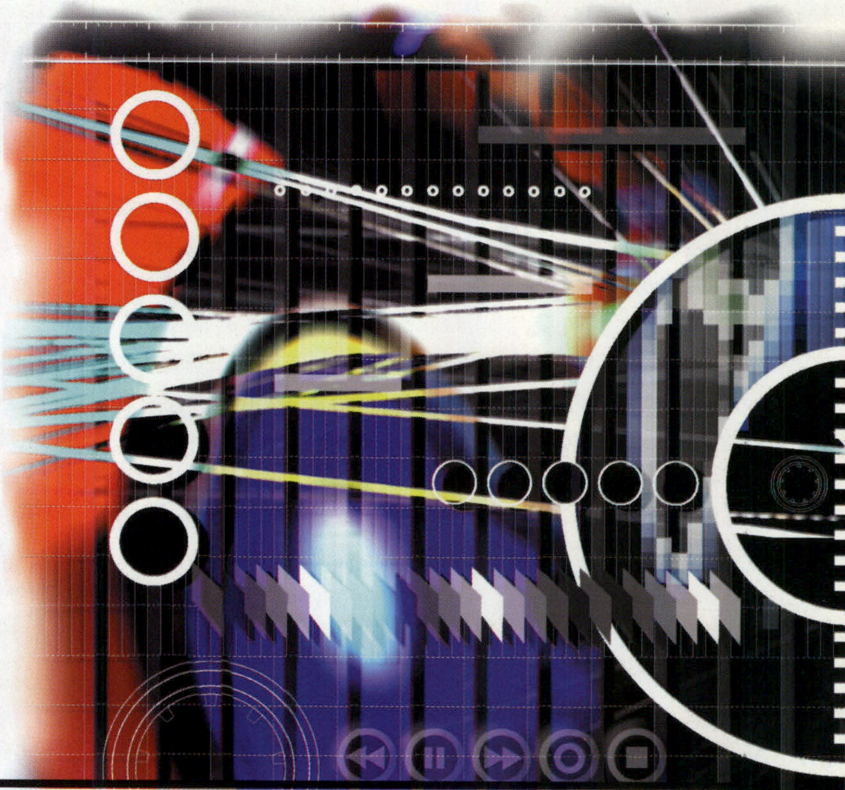
For example, put a shot of an action sequence on track A and a shot of a distant observer on track B. How you chop between them will create dramatically different effects. Long shots on the observer with the action sequence's soundtrack in the background heightens suspense. A short introduction shot of the observer leads us into the action smoothly. If the action includes a gunshot and we cut quickly back to the observer, we're aware of the scene being witnessed. And so on.

Practice and patience

The best way to learn the effects of editing is practice. Watch similar pieces made by other people, asking yourself at every cut why it was done there and what effect it had on you as a viewer. Take that knowledge back to your own footage and try it out – see if it helps or hinders your own work.

Non-linear editing software also tends to have about a million new features every release. *Premiere 5* added the much-needed clip window, where you can choose in- and out-points for a new clip before cutting it into the timeline. It also added a load of filters and transitions and clip-manipulation features that you shouldn't even touch before the main assembly is done.

Once you have a locked-down version of the story you want to see, you can start playing with transitions – dissolves and wipes – and effects. Each should be essential to the story. Dissolves represent the end of a sequence, wipes a passing of time. Nothing hurts the eye more than a *Kojak*-style overabundance of swishes and screen-divisions. Unless you want to do *Kojak* again, of course...



Step by step **Stick to the plan**

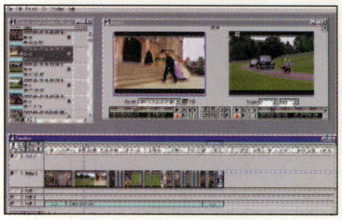
Your first few efforts might go wrong, but stick to the plan and you're on the right track...

1. Familiarise yourself thoroughly with your footage, making a log of which shot comes where, how good it is, and whether there's anything you need to know about it – it may be a bad scene but have a good reaction shot, say.
2. Sketch on paper a rough idea of what you want to achieve.
3. Assemble your rough cut. This will take anything from a day to a couple of weeks, depending on the amount of material you have.
4. Have dinner, get drunk – do whatever you have to not to look at it again until the following morning.
5. Keep repeating from (3) until you reach the end.
6. Review your rough cut and ask whether the order tells the story you wanted. Juggle the clips around and repeat from (2) until you're happy with the story order.
7. Start crafting your production with any special effects you have created, and adding some transitions. At some point you should invite outside opinions and check their reaction.
7. That's the lot – pat yourself on the back and repeat (4).

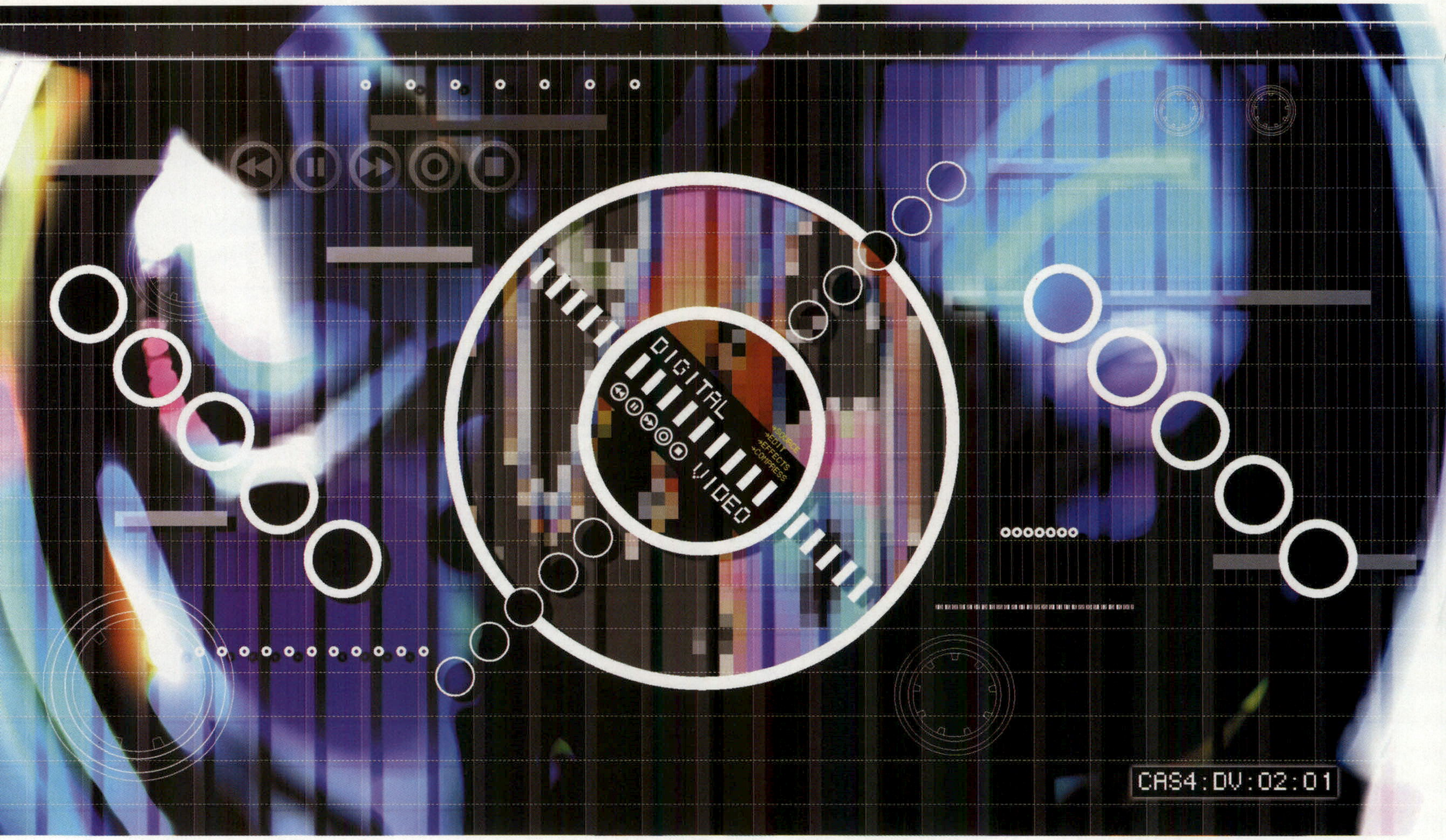
Seven virtues **Stick to these**

Things you really should do when undertaking a digital video project...

1. Be sure to obey your script.
2. Choose your music after the rough cut. Unless you're making a pop video, the music is there to complement the visuals – not the other way round.
3. Tempting as it is to see your name in lights, leave the titles to the end.
4. Give yourself enough time to edit. It'll make your piece much stronger if you tackle a single task and complete it in one session.
5. Be patient. Good editing is the creative achievement of calm people.
6. Practice a lot. With experience, you'll find yourself shooting with the final edit in mind.
7. Learn the rules first, that way you can break them later.



Digital video projects are not simple. Be calm and stick to the seven virtues.



[TUTORIAL] SOURCE EDIT COMPRESS EFFECTS

Premiere

Step-by-step editing

EDITING VIDEO CAN TAKE YEARS TO MASTER, BUT FIRST YOU'VE GOT TO CHOOSE YOUR SOFTWARE. ADOBE'S *PREMIERE* IS A POPULAR CHOICE...

Editing is what video production is all about. It's the difference between a set of disparate and untidy shots, often taken out of order and making no sense whatsoever, and a coherent structured program which people will actually want to watch. It's the difference between someone's holiday video, and *Shirley Valentine*.

And that difference more or less amounts to one thing: storytelling. Editing is about storytelling. It doesn't matter if you're making a fictional film, a news report, a pop promo or an advert – the reason for editing your footage is to tell a story. Every shot you choose to include or leave out, and everything that occurs in your video and sound tracks must be there to advance and clarify the story you're telling. If you keep this in mind at every cut, and don't include anything that doesn't need to be there – and don't leave out anything that should be there – then you won't go far wrong. The images and tutorials for this, and also the for the Effects section which starts on page 38, are from a scene we shot for the cover disk. Take a look at Chase.mov on your CD.

There are two ways to edit video: linear editing and non-linear editing. Non-linear editing involves digitising the relevant clips from your footage tapes, then arranging them, trimming them and adding

Hordes of extras can be yours the digital way (a la *Phantom Menace*, although not quite on the same scale). Some careful compositing makes special effects easy.

effects to them on some sort of timeline, where you can drag your footage around and try it out in various different ways.

If you must

Linear editing, on the other hand, is what you do if you absolutely can't avoid it. Basically, it involves connecting two or more VCRs together, then putting your raw footage on one machine and a blank tape in the other. You then rewind and forward wind through your footage tape until you locate the beginning of the scene you want to start with. Then hit Play and press the Record button on your other VCR. When you want the scene to end, stop the tape and locate the next clip.

You can get an edit controller unit to synchronise the movements of the tapes, but apart from that, you're on your own. It's a long, slow process. It degrades the quality of your picture. It's clumsy and it's repetitive. What's more, the few sound and video effects available to you (which all have to be created using separate bits of hardware) have to be manually controlled live, while tapes are rolling.

Linear editing has virtually no redeeming features. This is why as soon as non-linear suites appeared, they swept through production facilities and post-production costs plummeted.

Soft essentials

There are a number of editing packages available for both the PC and Mac. At the basic level, you can begin with something like *VideoWave*, *Premiere LE* or the *MP10 Studio*. If your work is more advanced, you can use the full version of *Premiere*, Ulead's *MediaStudio Pro*, or the upcoming AiST *MoviePack*. Prices range from around £80-£150 for the lower end products to £600-£700 for a full-blown edit suite.

However, most capture cards have an editor of some kind bundled, and with the higher quality cards it's often something like *Premiere* or *MediaStudio*. It's almost worth choosing your video card based on the editing software you get bundled.

You can get linear edit suites for your computer that use the serial port to control your VCR and camcorder – Videonics *Video Toolkit*, for instance. However, these are only really useful if you want to edit on location using a laptop, or want to work on professional recording machines without dedicating the disk space required for storing high-quality video clips.

Most non-linear software works in more or less the same way. We've used *Premiere* to demonstrate the techniques for this tutorial, but the methods are pretty interchangeable between packages.

Down to business

The first step in any project is to collect the raw material for your edit. This, of course, includes your shot footage which you've logged carefully, digitised into manageable length shots, and named in a way which enables you to instantly recognise the contents of each clip without having to play it through. However, it can also include a variety of other material.

For example, sound clips and effects, music files, still images, title and credit screens, plus any computer-generated effects or stock footage used in the production. Often, you won't have the finished effects when you first edit your production. These can be imported and laid in later, before the edit is finalised.

Most editors enable you to

The set-up

Here's the set-up we used for this...

PC

- A Pentium Pro 333 with 128MB RAM. You can't really get away with much less than 128MB RAM with software like *After Effects*.

Digital production suite

- The Canon XL1 digital camcorder, a broadcast quality camera. It offers about the best picture quality on the high street, and a good range of auto and manual functions. Also, with the ability to record your edited production back onto DV tape, you can archive your work at full quality.
- A Fast DV Master card, for digitising both analogue and digital footage. With useful breakout box for easy access, the DV Master provides all the material for the edit.
- Plenty of hard disk space. Video, and DV files (especially) take up a lot of space. The raw footage for the five-minute piece we've been working on here took 7GB. Longer productions obviously require bigger drives.

Software

- Adobe *Premiere* for editing. Adobe *Photoshop*, Adobe *After Effects*, Ulead *VideoPaint*, *3D Studio MAX*, *PhotoMorph* and *Painter 3D* for special effects.

Okay, so the budget's not exactly phenomenal, but we can still produce some interesting shots. A claustrophobic close-up in a great setting might be all it takes.

A light-sabre fight. Adding special effects like this should be left till later.

No matter what your story, remember it's the characters people care about.

organise the elements of your production into separate folders, so you can find each clip easily. They also enable you to replace off-line (or low quality) and unaffected clips with their final versions.

In a complex project, it's not unusual to have literally hundreds of digitised videos, sounds, still images, effects shots, animations and credit pages (we had over fifty for our five-minute scene!). This makes a well organised set of clips folders a must.

'Alien vision' in classic style is made easy with digital editing, thanks to the likes of *Premiere's* filters and effects. Bear any planned effects in mind when you're editing.

Chop chop chop

With all the elements of your production in place, it's time to start editing. Almost every non-linear edit package uses the same basic method for composing video productions – the timeline. A timeline graphically represents a video sequence, using a horizontal set of video and audio tracks. When you drag a video clip onto the timeline, it appears as a row of still images from the clip in one of the video tracks, and a parallel strip in an audio track showing the waveform of the sound (if the clip has audio).

By dragging the ends of a clip, you can alter its length to trim it to size. The timeline also offers tools for slicing clips so you can insert other shots into them, for separating the audio and video tracks, and so on. Simple editing is performed by dropping several clips into the timeline, trimming them to size, and dragging them into the correct order.

"More complicated editing involves using extra audio & video tracks. To add more layers of sound, effects and music, drop audio files into empty tracks below the video image"

Sometimes you'll find yourself filming (and then editing) completely empty space, if you're planning on dropping in some special effects later. This takes preparation.

You can then play back your production, and make any alterations you need to. It's usually easiest to work from the beginning to the end of your edit, but because you're using a non-linear system, you can work however you like. Sometimes it's easier to start by tying down vital scenes or shots in the middle of a production, then organise the rest of the show around them.

Alternatively, if the structure of the piece is very important, you might want to try out different ways of roughly putting together your shots, then go back later to tighten them up, adding close-ups, cut-aways and additions to the soundtrack.

The next step

More complicated editing involves using extra audio and video tracks. To add more layers of sound, effects, music, and so on, all you need do is drop audio files into empty tracks below the video image. Then trim them to size and drag them into position. There's a rubber band under each sound file, which you can drag up and down at any point for subtle control over the audio volume.

Many packages also enable you to add filters to your sound (in *Premiere*, you right-click on the clip in the timeline). Filters usually include echo, reverse, bass and treble, and so on. If you have a decent editing package, you'll also get some options for graphic and parametric equalisation.

You can use the extra video tracks when you need more than one image on screen at once. This could be, for instance, for superimposing effects, picture-in-picture shots and transitions like dissolves and wipes.

In order to create these effects, you create an overlap between two video tracks, and place an effect, filter or transition either on the top track, or on a transition track between the two. Which depends on your software, and the effect you're trying to achieve.

Few packages are able to display complex effects and transitions in real-time. You get a good idea what your work will look like by playing it through on the timeline. However, before you can view your production in all its glory, you need to render it.

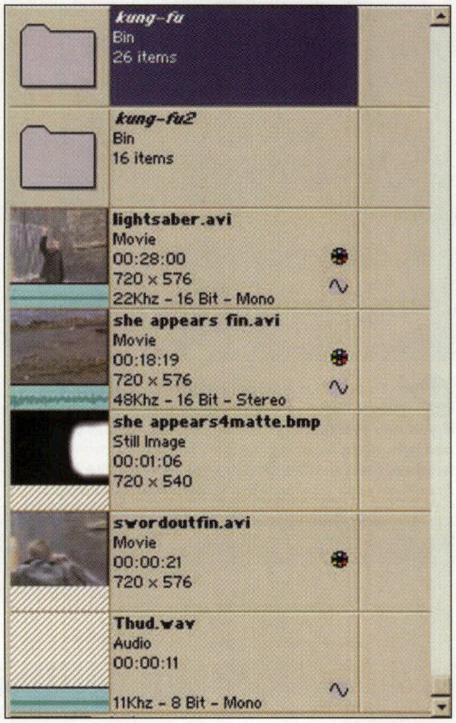
Rendering itself is quite a complex process. There are many different compression codecs for creating different types of output, and each has a bewildering array of controls – see the Rendering boxout. Most packages offer a series of presets for different output tasks, and these produce good results. All that then remains is for you to pick your rendering options, and leave the computer to produce your finished video.

Information

You'll find the final production from this tutorial, Chase.mov, on your cover CD in the root folder.

Stage one: Editing step-by-step

Take this as your masterplan and you'll get the hang of digital editing in no time. We're using Adobe *Premiere*...



kung-fu
Bin
26 items

kung-fu2
Bin
16 items

lightsaber.avi
Movie
00:28:00
720 x 576
22Khz - 16 Bit - Mono

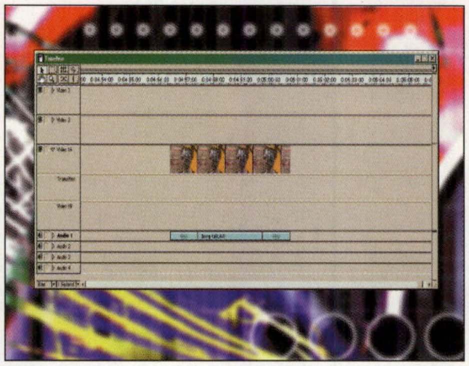
she appears fin.avi
Movie
00:18:19
720 x 576
48Khz - 16 Bit - Stereo

she appears4matte.bmp
Still Image
00:01:06
720 x 540

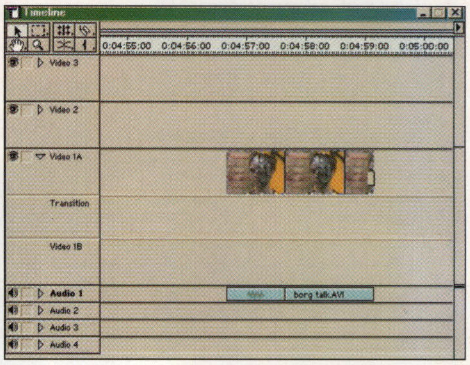
swordoutfin.avi
Movie
00:00:21
720 x 576

Thud.wav
Audio
00:00:11
11Khz - 8 Bit - Mono

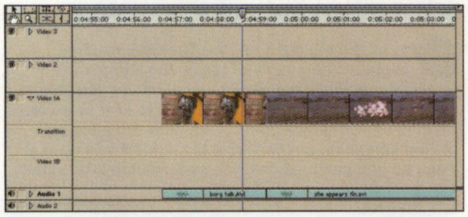
1 **Assemble your footage. *Premiere* enables you to import video, audio and still image files in a variety of formats, and organise them in your Project window. It's a good idea to digitise a great deal of short scenes, rather than a few long ones.**



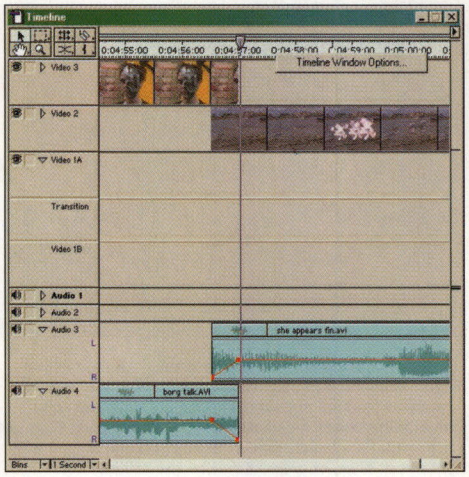
2 **Drag shots into the timeline. Simply drag -and-drop footage files into the Timeline window. They appear in audio and/or video tracks, depending on the contents of the file. You'll find that visual shots are displayed as a series of thumbnails representing the contents of the track.**



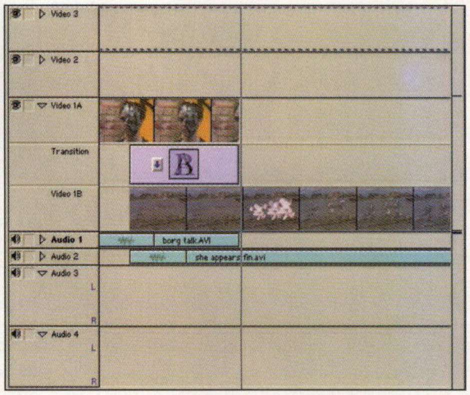
3 **Trim the shot to size. Grabbing the shot at one end enables you to resize it, to show more or less of the video clip in the scene. This doesn't change the contents of your video files – just the part of them that appears in your production. Dragging the middle moves the shot along the timeline.**



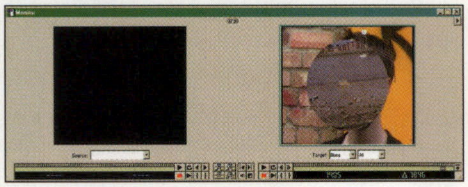
4 **Next, add another shot. Drop it after your first and it should snap into position. Dragging the playback head – at the top of the timeline – or hitting Play on the Monitor window shows how your first edit has worked out.**



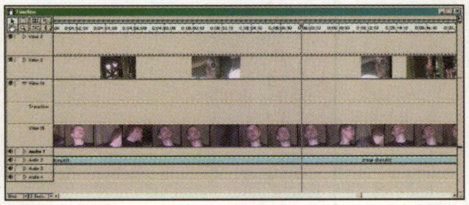
5 **If you want to smooth the cut between two scenes, try dragging the second shot onto a lower track, then moving it back about half a second. The top track is always the one displayed, but you'll hear the sound from the second track moments before it appears. Then, use the rubber band in the sound tracks to fade the sound up or down, mixing from one shot to the next.**



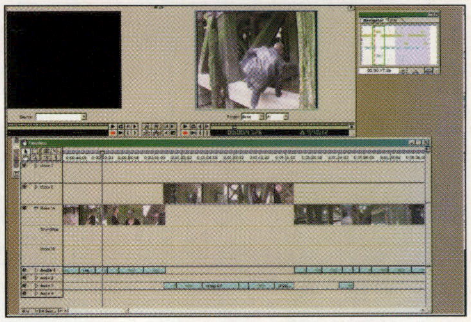
6 **To create an even smoother transition, drop one shot into track 1a and the other into 1b, with a two-second overlap. Open the Windows>Transitions window, and drag the transition of your choice into the transitions track – Cross Dissolve is the most common. It'll resize to the overlap between your shots.**



7 **If you Alt/Option-drag the playback head, you get a rough idea of how your transition looks. To see it at full speed, move the work area markers (the blue stripe right at the top of the timeline) to cover the transition, then hit Return. This renders a preview of the transition, which you can then view.**

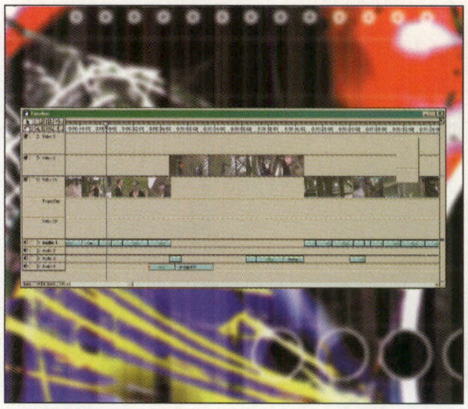


8 **If you have a covering shot of your entire scene, and several close-ups to cut into it, it's sometimes a good idea to drop the covering shot uncut into a lower video track. You can then drop in the close-ups and cut-aways on the top track, and remove their sound to quickly build up a scene.**

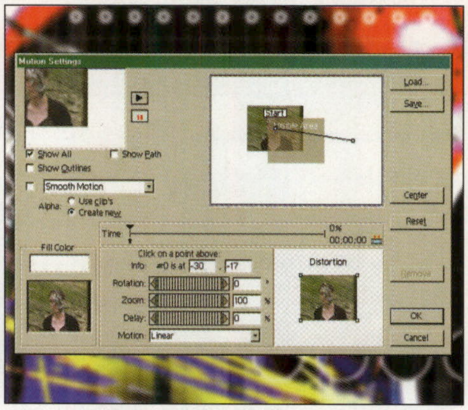


9 **To remove a shot, just highlight t and hit Delete. Alternatively, right-click it and choose Ripple Delete. *Premiere* shifts all the subsequent clips up to close the gap. If you want to insert a new clip between two shots, you can simply drop it between them – *Premiere* creates a space for it automatically.**

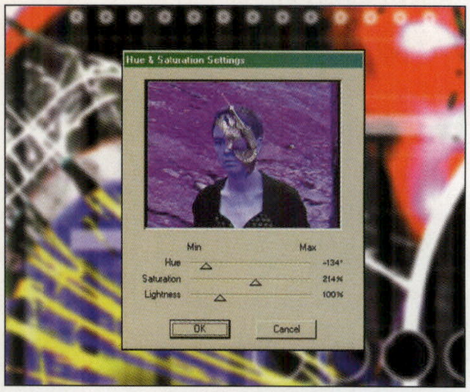
Stage one: Editing step-by-step continued...



10 Right-clicking on a clip and selecting Lock enables you to lock it into place. If you lock the video portion of a clip, you can then move the audio independently of it. This is useful when you want to separate the sound and video of a shot.

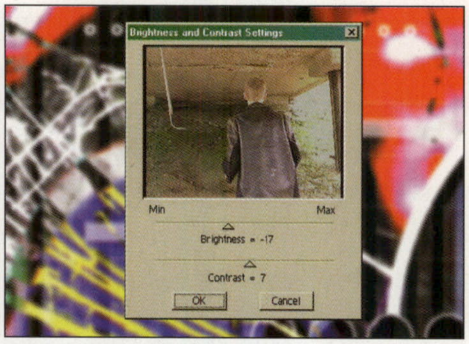


11 Right-clicking also gives access to various functions, such as Speed to slow down or speed up your clip, Frame Hold for freeze-framing, Motion for moving the shot around the screen, and Transparency for superimposing one clip onto another.

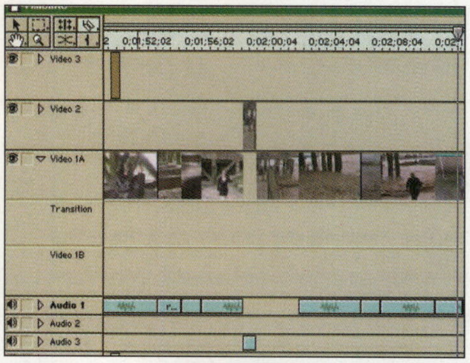


12 To add extra effects, right-click and select Filters. Some of *Premiere's* filters will be familiar if you use *Photoshop* – except in *Premiere*, you can animate them by dragging the timeline in the Filters window, then setting different values for the filter. *Premiere* also interpolates between the values.

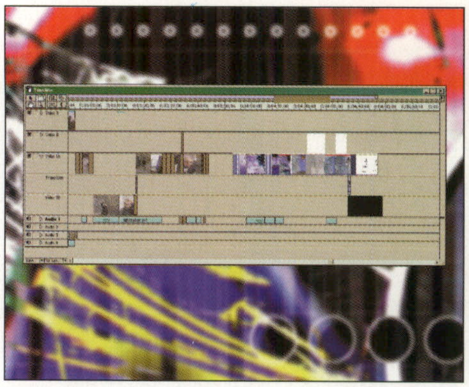
13 If you find that you've 'crossed the line' in your shooting during editing, and someone who should be looking in one direction is facing in the other, you can sometimes cheat with the Flip Horizontal filter. This mirrors the entire shot. Watch out for signposts and so on in-shot, as these are also reversed!



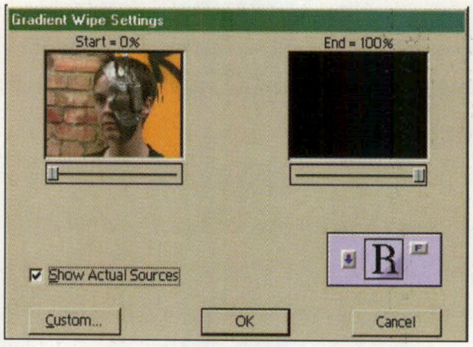
14 Another rescue can be done with the Colour Balance and Brightness /Contrast filters. Many cameras provide automatic white balance and light level adjustment for each shot, but sometimes they get it wrong. This means that your shot can be tinged with yellow or blue, or objects can be too bright or dark. Use filters to compensate if two shots don't look right when cut together.



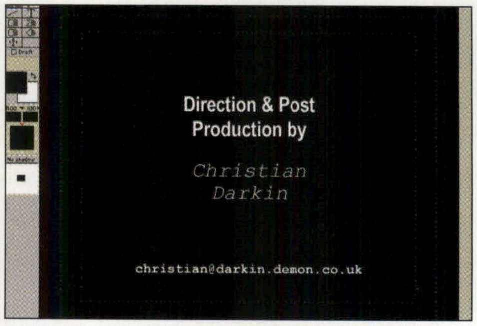
15 At the top right of your Timeline window, there's a selection of tools. The Razor tool enables you to slice a clip at any point, so you can insert other clips into it, or move parts of it to another stretch of your production. Also, cuts are invisible during playback, so the Razor is useful if you want a filter so you can begin working some time into a shot.



16 The Block Select tool enables you to pick several clips at a time, and move them around the timeline without affecting their position relative to each other. This makes it easy to construct your programme in parts, then arrange those parts later.



17 By selecting Project>Settings, you can create a universal colour matte – an empty screen of whatever colour you choose. In order to make your production fade to black when it's finished, create a black colour matte, then place it on the timeline at the end of your edit. Then insert a Cross Dissolve transition to mix slowly from your last shot to black.



Direction & Post
Production by

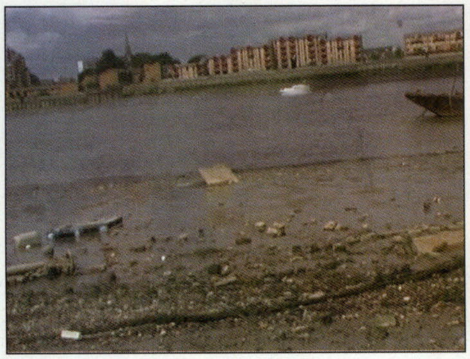
Christian
Darkin

christian@darkin.demon.co.uk

18 You can create your titles within *Premiere* too. Select File>New>Title and type in some text. The editor is basic, but you can choose your typeface, size, colour and whatever. Now save the title, close the window and import the PTL file into *Premiere*. For scrolling credits, right-click the title bar to create a title page longer than your screen, then use the image pan filter to animate it.

Stage two: What you need to know

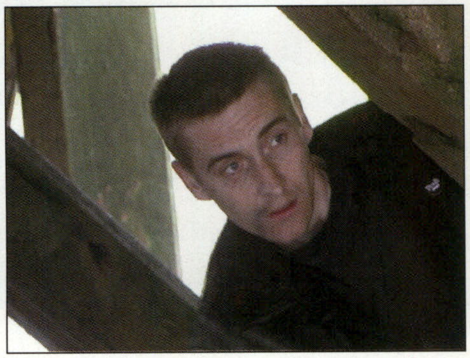
For a brilliant edit, ask yourself: What do my viewers need and want? Which bits am I going to hold back to add interest?



1 **Establishing shots. Generally, the first thing your audience wants to know is where they are. A wide establishing shot orientates your viewer and starts to give an idea of the atmosphere of the scene. This is shown above, where you can see a desolate beach scene, which certainly isn't Jamaica...**

2 **Meet the characters. Whether you're editing a drama, a documentary or simply an interview, your audience will become engaged more quickly with the action if they're introduced to a character early on. A close up of someone at this point plants the notion that this is his or her story.**

3 **All productions are about conflict – whether it's conflict over the fate of Anakin Skywalker, or which brand of soap powder washes whitest. Even a training video is a conflict over the best way to do something. You can introduce conflict in many ways: here, it's done graphically.**



4 **Now we have the beginnings of a story. Hopefully your audience knows whose side they're on and what the stakes are – it's time to tease them. They're waiting for the resolution of the conflict, so the idea is to put continuous obstacles between the characters and their goal, constantly delaying the conclusion while making it seem just moments away.**

5 **The most skillful filmmakers are those that keep their audience interested in the fate of the characters, making their plight ever greater even as they approach the resolution. Here, every scene aims to raise the danger for our main character. He's being attacked by an alien wielding a light sabre-type weapon. Will he survive?**

6 **Construct every scene as though it's a short, standalone production. Besides the overall conflict of your video, each scene explores its own thread of story that needs to be resolved by the end of the scene – even if this resolution doesn't seem to bring the final conclusion any closer. Here, our hero takes the only course available to him – he runs away.**

Rendering What kind of output do you need?

Content

Rendering can be extremely time-consuming and can turn up a whole load of confusing alternatives. The options you choose will depend on your own set-up and the destination of your finished movie. But here are some brief guidelines to file sizes and settings. For more, see the Compression section, beginning on page 50.

Internet

Some editors offer direct output to RealMedia format. If yours doesn't, you'll need to render a small version of your video – about 160x120 pixels – in *Cinepak* format, then import this into a free converter program like *RealProducer*.

CD-ROM

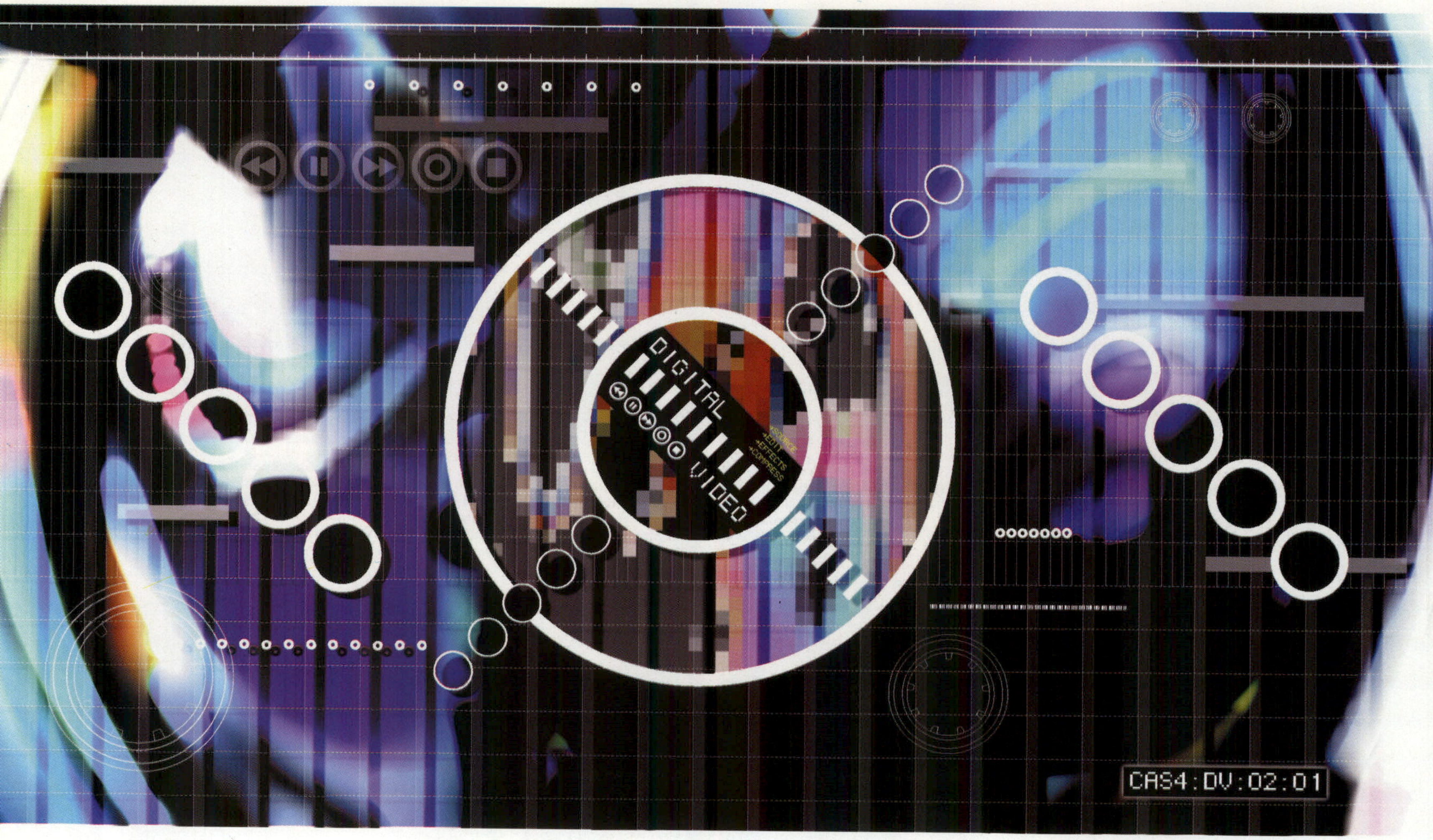
Data rate and quality are the trade-offs here. Try to keep your data-rate bellow 350KB per second, and the resolution at about 320x240. If you want the widest possible audience, use a *Cinepak* codec, and render as a MOV file for compatibility with Mac and PC platforms.

VHS

768x576 is as high a resolution as TV gets. Compression rates will vary, as each capture card ships with its own codecs. However, as a general rule, between 1200-2400KB per second gives you a pretty good picture.

Digital

Digital video is pretty standard at around 3500KB per second. There aren't that many controls you can alter to change its quality. Your results will depend more on the quality of your original material than anything else.



[TUTORIAL]

paint* and effect*

Desktop editing

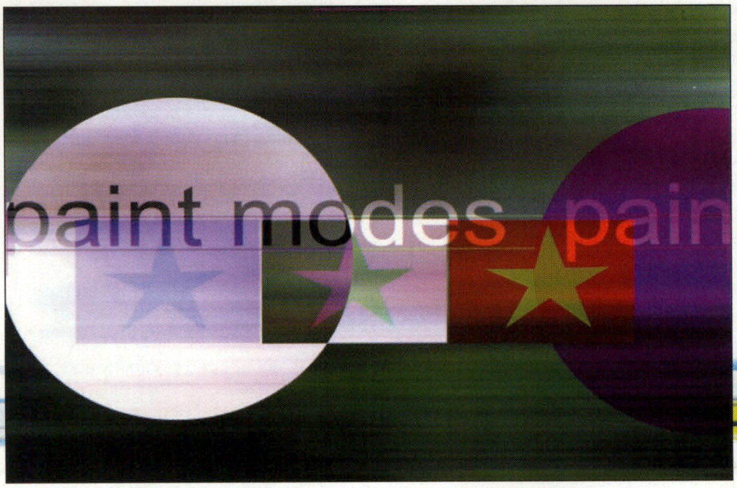
CAN YOU REALLY GET HIGH-END, PRO-LEVEL FUNCTIONALITY ONTO A DESKTOP? AND HOW ON EARTH DO YOU USE IT? TOP POST HOUSE THE MILL PUTS YOU IN THE KNOW WITH DISCREET'S *PAINT AND *EFFECT**...**

It's been a long year since Discreet unleashed its feature-packed new media products for the eager post-production industry. In the same year, the company behind the powerful and fully interactive *flame*, flint** and *inferno** industry-standard effects products has merged with Kinetix to forge a strong integration with *3D Studio MAX*. It is now a division of the third largest PC software manufacturer in the world: Autodesk. Quite simply, Discreet joined the big league. But does the future lie in the small league products?

A case in hand

The Mill – London's leading post-production facility – was one of the first facilities to adopt *flame**, and is currently Discreet's largest UK-based customer – not to mention among the top ten biggest customers in the world.

Recently, the post house took delivery of a Discreet *paint** and *effect** system, for a deeper look into what these products have to offer, how they could be used on a real-life job, and – most



Compositing layers of graphics – including text and semi-transparent layers – is a feature common to both *paint and its big Discreet brethren.**

importantly – how they could be integrated into the facility's current infrastructure. The Mill's heads of 2D, Ant Walsham and Dave Smith, took their turns in *flame**, as did David Bowman from The Mill's Mac-room and Dave Philips, who regularly supports the senior *flame** artists with work on *flint**.

So – what do the professionals used to working with multi-thousand-pound software and hardware, make of these desktop products? Are they satisfied with the range of functions and power, or frustrated at the lack of flexibility? Can the software compete with the high-end and become part of the workflow of an extremely competitive post production house? Here follows the Mill's team's collective comments…

The pros talk

Discreet's *paint** is the only Mac-based program to offer vector-based animated paint. However, there is a disadvantage to the vector approach: often you have to work on one frame, then another, and then return to the first for tweaking. The problem is, when you return to the previous frame, your application has to recreate the strokes you applied. If you're painting a matte with hundreds of strokes, as you may well be, this become incredibly time-consuming.

The way to get around it is either to use the RAM Player, which caches frames so things move faster, or – if you don't want vector strokes – to use the Commit Edits feature on Every Frame command. This flattens your *paint** document into a bitmap, either on a per-frame basis or at your command, so you never build up a vector list of strokes.

*paint** can work in a bitmap-only mode, but vectors offer a significant number of advantages. An operator would have to spend some time working with the software before concluding that bitmap only is better – if ever.

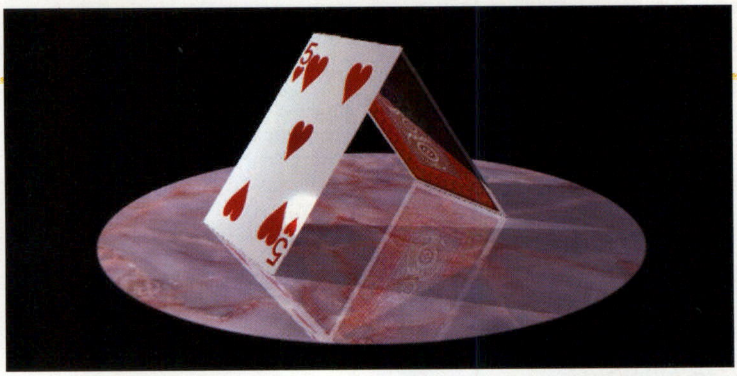
*paint**s vector paint strokes are as good as those in *flame**. In fact, *flame**'s are less flexible. And while there's no Bitmap Paint brush in *paint**, as in *flame**, there's no real need for this feature. Instead, *paint** has Airbrushes, Blur brushes and Dodge, Burn and so on – essentially all of the same paint types that *flame** supports (and more), but in a vector-based environment.

3D space

Adobe *After Effects* has a multi-compositions feature, which enables you to nest compositions within other compositions – but this isn't currently available in *effect**. This will be missed, since it's used regularly in post production work, although Discreet is now working on the feature.

One major advantage, meanwhile, is that *effect** works within a 3D space, making it the only Mac- or PC-based program to offer this feature in full. The benefit is that you get ultimate control over the layers, with far more flexibility over complex composites. *effect** also offers 3D effects like shadows, reflections and so on, which work out to be very useful. *After Effects*, on the other hand, only works within 2D space, which can be quite limiting.

Discreet's software handles type very well, and is reminiscent of Macromedia's *FreeHand* in this respect. Once you've typed in your text, *paint** converts the whole word into a grouped object. This remains fully editable, plus you can ungroup it into separate elements and change the style and attributes of the font if necessary. Excellent.



This image shows three images arranged in 3D space with camera, lightning, textures, surface properties and raytracing. It illustrates the potential the 3D compositing environment in *effect offers in creating true 3D animation. This is only simulated by plug-ins within other 2D compositing software. You can add multiple light sources to a project with timeline, Graph and View window manipulation. Lights may be defined as spot, distant or point, with full animatable control over intensity, colour, spread, softness and ambient properties.**

Lights also mix additively for colour blending. Cameras have a variety of lens settings, including control over field of view, aperture and depth of field. If you use *3D Studio MAX*, you can import camera animations from 3D rendered scenes directly into *effect, then use the facility to accurately composite other elements into the original composition. For example, a studio motion control capture could be applied to the 3D scene, and then the original studio actors accurately combined within the virtual environment. The surface properties enable front and back visibility, independent control over shadow casting and camera visibility, blending modes, mirror reflections, luminosity, diffuse content and specular and glossy surface attributes – all animatable, of course.**

> ***"effect* works within a 3D space, making it the only Mac- or PC-based program to offer this feature in full. You get ultimate control over the layers, with far more flexibility over complex composites"***

A useful feature in *Commotion*, the video editing package from Puffin Designs, is a background canvas area that appears when you zoom in on a shot. This is a major advantage if you're working on an object that appears at the very edge of the shot. Unfortunately, neither *effect** nor *paint** has this specific feature, although in *paint** you can resize your window to get as much canvas as possible (but not under magnification).

Mattes and Marquees

Both *paint** and *effect** have a reasonably flexible Marquee tool, a really useful feature for making mattes and garbage mattes. It's similar to the rotosplines feature in *Commotion*. It gives you Bézier shapes, point-by-point animation and channel control (which *Commotion* does not have in its feature-set, but rather just a single shape animation channel).

This is in addition to Scale, Position and Rotation channels for each shape, as well as Boolean operations between shapes (so you can break a roto object into multiple passes for easier editing), and more. If you use the RAM Player right off the bat, it also gives real-time feedback when you scrub. You can actually see the selection change, the feedback is so fast.

The Extended RLA image format that you can render from *3D Studio MAX* enables you to retain many of the original elements of your 3D scene within a 2D image. Here's a scene that retains the Z position, or 3D depth, of the original models, including object shapes, position within 3D space and texture mapping properties. Indeed, you can even still apply a range of environmental effects, such as fog, depth of field, flares and glows.

All are animatable within 3D space and react with the original model geometry. This offers great flexibility to tweak scenes at a later stage for lighting, colour, atmosphere and the compositing of additional elements – the accurate matching of actors within a scene, say. You can also create effects with, say, blue screen elements moving behind 3D objects through their position with Z-depth. The 'live link' between *3D Studio MAX* and *paint enables real-time painting and texturing in either 2D or 3D, with the complete range of paint tools and effects fully animatable over time.**

The masks in *effect** are a little different, and somewhat slower to work with than *paint**. The latter seems to be the tool to use for serious matte and garbage mask creation, just as *After Effects* users tend to use *Commotion* for serious matte and garbage mask work.

High-end to desktop

*effect** and *paint** both offer a brilliant motion tracker, using the exact same algorithm as in *flame**. So in theory, the results should be exactly the same, in terms of accuracy at least. Indeed, Discreet seems to be porting a good deal of its proven and industry-standard effects technology down from the high-end SGI products. This is the market where Discreet originally made its name, and where the company is still arguably the best in the industry.

Control of all your objects – which includes every paint stroke – is remarkably fluid in *paint** and *effect**. The function curves are as easy to control as those in *flame**, although making everything editable can sometimes be complicated – especially for trainees learning to make mattes. And although there's a Commit Edits function, you need to have some experience on the machine to work out exactly when to use it – and equally when not to.

Compatible questions

It's great to see that Discreet has incorporated plenty of blend modes in *paint** and *effect**, like those in *Photoshop*. Really, this type of feature should be standard in tools of this nature. And since many effects facilities would have a whole range of products, some similarity and compatibility is good. Both *paint** and *effect** are compatible with *After Effects* plug-ins too, which is very useful.

Compatibility with *flame** and other Discreet SGI products is something the senior *flame** artists at The Mill take very seriously. Why? Because it's important to be able to assign smaller jobs on large projects to trainees and junior artists, then bring the shots back into *flame**.

Consider this: The Mill's success is due – at least in part – to the cultivation of talent in-house. For example, at least three of the current board members used to be runners, and learnt their skills on the way up. So the company currently runs a *flint** in each *flame** suite, specifically so junior operators can work directly with senior *flame** artists. Learning to deal with clients in a suite is as important for trainees as is learning the art of great compositing and special effects.

Learner flames*s?

Currently, *paint** and *effect** are partly compatible with *flame**. And fortunately, Discreet seems to be serious about interoperability and integration between the SGI-based effects products and the NT/Mac-based effects products.

But that's not to say that *paint** and *effect** are like 'baby' *flame**s. They are good tools for learning the principles of 2D compositing, and offer good video capture, but unfortunately neither offers much advantage in learning *flame**. This is because their interfaces follow the quite different desktop look, as per *Photoshop*, say. Also, *paint** offer a different paint tool-set as *flame**, which is confusing if you've learnt painting through vectors instead of bitmap.

*effect** is probably the closest of the two to *flame**, using the same 3D environment (essential for high-end work). Its timeline also presents an advantage for trainees, and some other portions of the program are similar to *flame** – the Channel Editor and the Tracker, among others.

It seems that Discreet has understood the need for a solid learning path, and plans to make *effect** more like *flame** as time goes on. This is good – but that's not to say we'd like like *effect** to be a watered-down *flame**. It offers advantages and disadvantages of its own, and has a way of doing things – a less modular approach, to start with – that would be lost if the *flame** approach was simply copied.

At the end of the day, Discreet has designed *effect** and *paint** to be stunningly powerful and competitive with other products in their own market space and beyond. Both desktop packages offer many of the benefits of expensive, high-end, professional tools, but with greater ease of use and a far lower price tag.

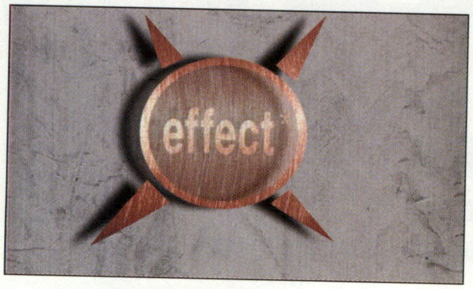
Over the next page, The Mill's team runs you through some of their most exciting features…

Information

The Mill is one of the UK's best post production houses, more info from **w** *www.mill.co.uk. You'll find demos of both paint* and effect* on your cover CD – install them via the interface.*

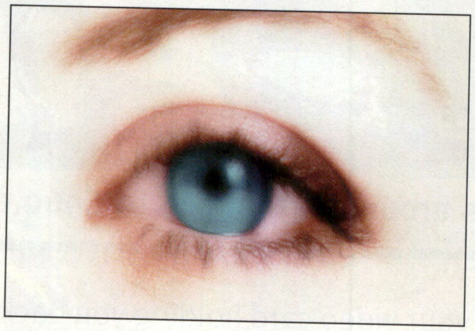
paint and effect**: Real jobs

Post-production artists from The Mill give the low-down on individual projects using *paint** and *effect**



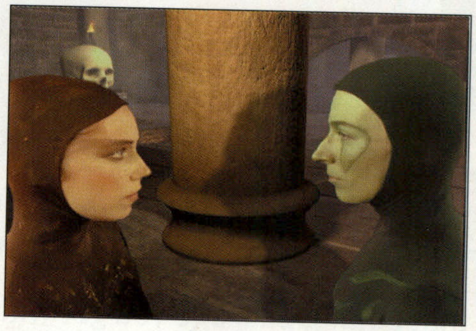
effect* **enables you combine multiple layers and mattes in both 2D and 3D with textures, lights and effects. An important aspect of development within the Discreet product range is integration – the ability of separate Unix and NT applications to communicate together.**

The logo could have been created during the editing of a television program, using Discreet's *edit. Timeline elements are selected and launched seamlessly and precisely into the painting or compositing environment (either on the same machine or across a network), and then rendered back into the original section of the program. This enables the real-time, graphic overlay features of *edit**.**



This image was developed within *paint to combine colour effects, vector selections, image tracking and modes to create an atmospheric image. Selections within *paint** are flexible, totally animatable at both the object, control and pivot level, and can be multiple-point tracked.**

Vector-based selections provide a powerful tool in masking, matting and design – and visual effects work in general. In addition, *paint strokes themselves are vector based, or can be instantly committed as is the case in traditional, bitmap-based painting applications.**



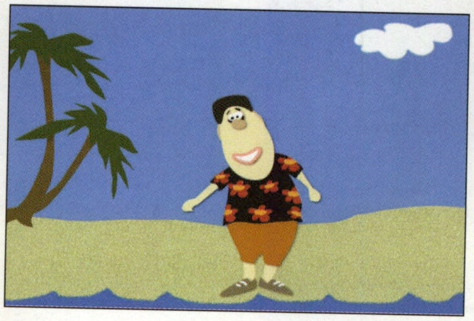
This illustrates the functionality for combining actors within a 3D scene. Notice how a light in the effect composition has been used to cast a shadow from the actors onto the 3D scene.

The profiles of the actors' shadows accurately deform according to the shape of the 3D pillar. Fog and glow elements have also been added.

Using surface and shading properties on the RLA scene within *effect enables accurate, raytraced shadows and reflections to be cast onto the scene floor and objects.**

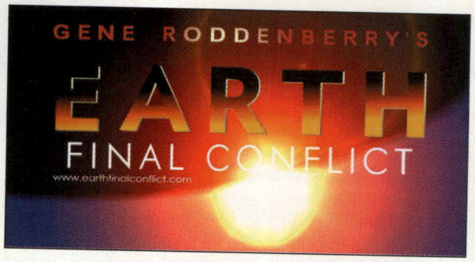
These are two frames from TV series *Earth Final Conflict* that have been stabilised to counteract image instability from the camera, using the tracking technology in both *paint and *effect**.**

The image tracking has been directly ported from Discreet's high-end software, *flame. Both one- and two-point stabilising is available, to account for almost any kind of image instability you need to remove or apply to a composition.**



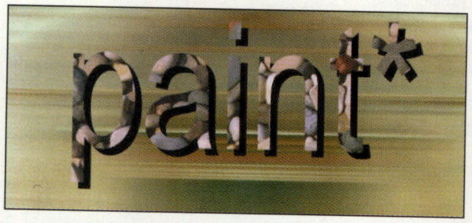
The vector properties of *paint enable fast and intuitive control of the painting and graphics environment. The scene shows a frame from a cel animation developed within *paint**, where simple vector objects can be built into hierarchical groups and animated at both object and control point level. It's fully animatable directly from the Composition window, timeline or Graph channel.**

The shirt flowers have been used to apply a texture to the shirt, using the Preserve Transparency function. This traditional cel animation technique assists the animator to control the visibility of drawn elements within the scene.

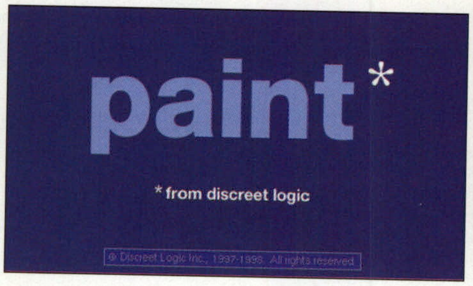


This shows a text-based animation developed within *paint, combining effects, gradients, text and animation to produce a graphic title. Text, like the other tool objects within *paint**, is vector-based and provides smooth scaling and animation of words, letters and control points.**

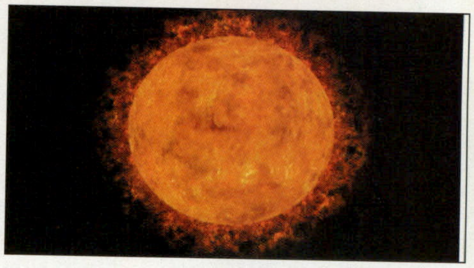
The object-orientated nature of the software enables you to combine almost any selection of modes, gradient, clone and paint modes, and animate them over time. The Gradient Editor provides a rich, fully animatable painting tool that you can combine again with almost any of the paint or object tools. And if you think you may be able to track something, try it – you probably can. This includes graphic objects and strokes, object control points, wand selections, fills and effects.



paint*, **through both its text objects and selections, enables you to combine almost any collection of moving or static images, modes, gradients and effects with animated or static typography. This simple image shows how the vector-based, object-layered approach of *paint** enables you to quickly assemble images and text, and, through the Project Import feature, to save it as a template to combine within other compositions.**


paint*
* from discreet logic
© Discreet Logic Inc., 1997-1998. All rights reserved.

paint* **provides a rich range of image-blending modes, which you can apply to almost any tool or image element within *paint** or *effect**. Image aspects such as colours, opacity and gradients are all fully animatable over time.**



Several effects are combined on a simple 2D shape for this fiery image. Displacement, bump mapping, turbulence and noise are all available in *paint and *effect**. The good news for desktop-level users is that the software will also accept most of the excellent, third-party plug-ins for *After Effects* and *Photoshop*.**

computer arts special
The definitive guide to digital video • Mac & PC

cas04

buyer's guide

The best non-linear video editors around – from £16 to £560,000

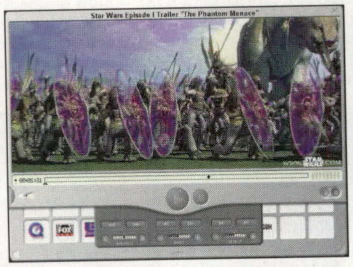
Is that editing package you got with your video card holding you back? Choosing the right program is vital, so make sure you know what's available – and just what you want to do – before choosing...

Below £500

QuickTime Pro

PC & Mac
$30
Apple
Buy on-line
w *www.apple.com*

Create Internet-ready audio and video, add special effects to your film footage, or simply create presentations and slide shows. *QuickTime Pro* also exports videos, sounds and pictures to more than a dozen standard file formats. This nifty little utility enables you to play back full-screen, re-sizable video, create new streaming movies, copy and paste popular Internet media formats, and convert pictures between formats. *QuickTime* includes a limited selection of effects, and now offers support for *Flash* animation. If all you want is a compact set of tools for creating and exporting movies for the Web, *QuickTime Pro* does the job.

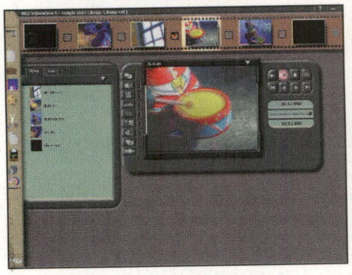


QuickTime: **upgrade to the Pro version and you can author video as well. NIce.**

Avid Cinema

PC & Mac
$85 (PC), $100 (Mac)
Avid
Buy on-line
w *www.avid.com*

Like *VideoWave*, *Avid Cinema* offers video capture and simple editing for the novice user. It also houses a pleasantly intuitive interface, and all the effects you need for spicing up your home video. Unlike its competitors, it's only compatible with five makes of video capture card, and doesn't offer MPEG-1 support. But third-party manufacturer Ligos has brought out a plug-in to solve just that problem, which also enables you to create MPEG-2 quality video. Not an especially capable package but it at least has the Avid name, which is always something to rely on.

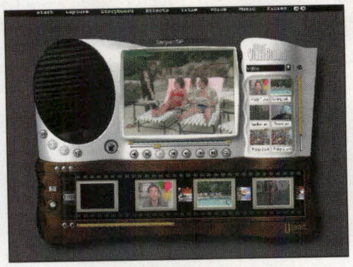


Though not a particularly high-end package, *VideoWave* is widely-used.

VideoWave II

PC only
£80
MGI
t *0171 365 0034*
w *www.mgisoft.com*

If you're new to desktop video and want a simple-to-use package, then this could be for you. The program has three main windows: Clipboard, Monitor and Storyline, which keeps the interface uncluttered and simple. *VideoWave* offers limited effects, a video animator for creating 'picture in picture', support for MPEG-1, and basic chromakey effects. Throw in the effective titling system and a friendly Storyline editing system, and you're looking at a top home-use package. If your aspirations go beyond editing a wedding video or presentation, however, you should really look elsewhere.



Ulead's *VideoStudio* is the lower-end, 'friendly' version of *MediaStudio Pro*...

VideoStudio

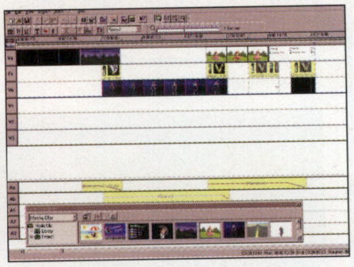
PC only
£81
BIT UK
t *01420 838 11*
w *www.ulead.com*

This product is aimed squarely at the home user. It comes with an instruction video to get you started, and offers a storyboard-style interface. Low-end doesn't translate into low quality, however, as *VideoStudio* also throws in a timeline, 109 transition effects, multiple undos and the ability to create streaming video for the Web. SmartRender technology means that you only need to render changes to your video, and the software supports MPEG-1 too.

Digital Video Producer 5.5

NT only
$195
Asymetrix
Buy on-line
w *www.asymetrix.com*

Digital Video Producer is a system for capturing, assembling and editing audio and video clips. The drag-and-drop interface is user-friendly, while unlimited video and audio tracks, a healthy number of transitions, and varied effects combine to offer flexibility. DVP also includes *Digital Video Recorder* (DVR) capture software, which transfers video and audio from any video source, your VCR or camcorder say, to your computer. You can trim clips and save them in the Media Library, where you can also save individual frames as bitmaps, play your clips, and e-mail videos direct from the application. It's not the best-known package out there, but it's worth investigating nonetheless.



...and here is *MediaStudio,* easily a rival for the mighty *Premiere* from Adobe.

MediaStudio Pro 5.2

PC only
£469
BIT UK
t *01420 838 11*
w *www.ulead.com*

Essentially a collection of five applications, MSP aims to deliver a complete digital video solution. To this end, there is a video capture module as well as the Video Editor and Audio Editor. Also, VideoPaint is a rotoscoping package that offers numerous opportunities for non-destructive editing. There's also a full quota of selection tools, including Ruby-mask, onion-skinning and frame-flicking. The latter enables you to preview a few frames without having to render the movie. Also worth mentioning is the batch rendering and SmartRender technology, which enables you to make changes to a project and then re-render just the parts you've changed.

Between £500 and £2000

Premiere 5.1

PC and Mac
£517
Adobe
t *0181 606 4000*
w *www.adobe.co.uk*

Aimed at graphics professionals working in multimedia and Web development, *Premiere* has long dominated the middle ground of the video editing market. The package may seem pricy for this level, but you get a lot for your money. First off, *Premiere* is flexible. It offers a sophisticated Timeline window, which has full drag-and-drop capability, and a sizeable selection over v5.0 includes a more intuitive interface and improved audio editing tools. *Premiere* also supports graphics and video cards, and even enables you to produce optimised Edit Decision Lists, usable with professional video equipment.

EditDV

PC and Mac
£528 (£703 inc FireWire card)
Computers Unlimited
t *0181 358 5857*
w *www.digitalorigin.com*

A non-linear editing system designed with professional video editors in mind, *EditDV* integrates compositing, editing, special effects and animation into one package. Using a 3-Point Editing system which includes back-timing and Fit to Fill, *EditDV* enables you to simply drag and drop your clips into the order you want and press play. This simplicity of use couples with both high-end effects like Chroma and Luma keying, and unlimited video and filter layers, to offer a comprehensive tool at a fraction of the cost of high-end solutions.

Aura

PC only
£529
PAR Services
t *0171 437 1486*
w *www.newtek.com*

Aura seeks to be a jack-of-all-trades, combining video layering, natural media painting, animated brushes, and onion-skinning, plus a load of output options. It also offers technologies more usually found in more expensive video paint programs – time stretching for video and support for Photoshop plug-ins, for example. Overall, the package provides plenty of scope, and although it appears to be a bit of mish-mash of tools, somehow it works.

Movie Pack

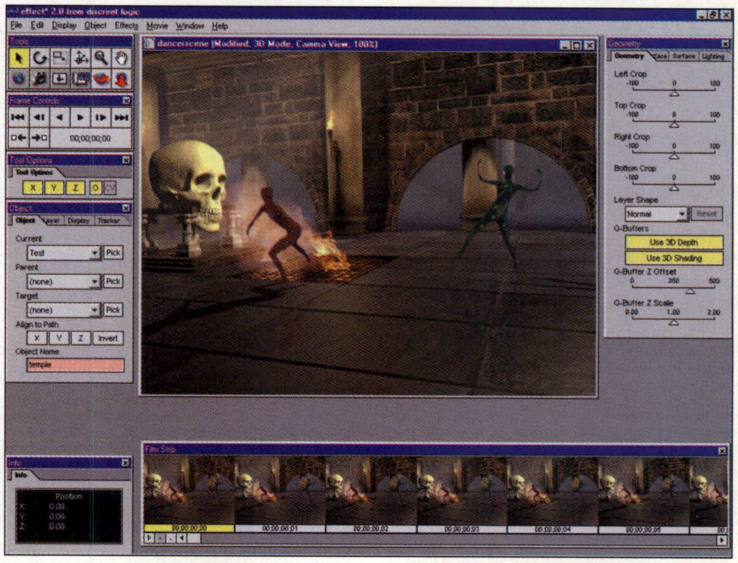
NT only
£679 (when released)
t *AIST 01525 713 671*
w *www.aist.com*

AIST and SGI have joined forces to develop *MoviePack*. It's claimed that the software fully utilises the bus width available on the new Silicon Graphics Visual Workstations, overcoming the common problem of bottlenecks in data transfer. The companies estimate a seven-fold speed increase against other computer systems. However, *MoviePack* is not just fast software. It's also touted to be a complete video editing and animation solution. *MoviePack* is currently under publicly beta-testing worldwide to ensure compatibility. You can get yourself a beta CD for around £20 by contacting AIST, and save yourself heaps of money on the final release, which should hit the shelves soon.

Judgement

NT
£880
Eidos Technologies
t *0181 636 3000*
w *www.eidostechnologies.com*

The most startling aspect of *Judgement* is its interface. Eidos, in an attempt to cater for a variety of skill levels, has made *Judgement's* interface into a fully customisable marvel. Taking the idea of Favourites from the Web, it enables you to configure a collection of Favourite modes and tools that suit your needs. The 3-point interface offers support for both storyboard and timeline editing techniques. The latter uses a unique 3D timeline display, which enables the entire programme to exist in the timeline of any working view. Mixed compression media is introduced through Add, Insert and Overwrite edit modes onto unlimited video and audio tracks. You get extensive Trim tools for performing fine cuts, and a Media Logger that organises details about the content of your clips, and sorts them into a hierarchy for easy management.


effect* 2.0 from discreet logic
File Edit Display Object Effects Movie Window Help
dancescene (Modified, 3D Mode, Camera View, 100%)
Geometry
Left Crop
Top Crop
Right Crop
Bottom Crop
Layer Shape
Use 3D Depth
Use 3D Shading
Film Strip

Discreet's *effect represents a quantum leap in editing packages, especially at the desktop Mac and PC level. Offering both 2D and 3D editing, raytraced shadows, reflections, integrated 3D graphics and all manner of cleverness, it's a real winner.**

paint* 2.0

PC and Mac
£1639
Autodesk
t *01483 462 600*
w *www.discreet.com*

This is essentially a *Photoshop* for film and video footage. *paint*'s* range of paint and effects tools is very similar to Adobe's world beater, although you also have control over the temporal aspects of your images. The interface is also very similar, so if you're at home in *Photoshop*, you'll find *paint** a dream to use. The major difference, and something which makes *paint** unique, is that everything is treated as a vector object, including paint strokes, fills and other effects. So everything you lay down has the flexibility of a vector object (it can be scaled, rotated, undone and so on) but with the look of a bitmap. *paint** is an exceptionally powerful package, and also offers onion skinning, 38 different draw modes, precise motion analysis, and effortless integration with *3D Studio MAX*.

effect*

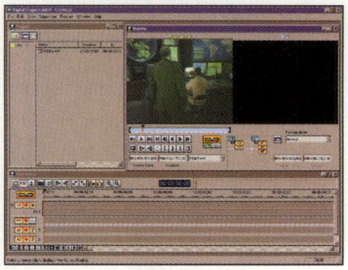
PC and Mac
£1639
Autodesk
t *01483 462 600*
w *www.discreet.com*

Like *paint**, *effect** is not, strictly speaking, an editing package. However, both can be used for this purpose and are both especially handy for spicing up your digital video footage. While *paint** adds pizzazz to your images, *effect** composites and post-produces the raw material into a sleek package – and not just in two dimensions. *effect** can composite in 3D, so you genuinely move layers through X, Y and Z dimensions, complete with raytraced shadows, reflections and lighting effects. *effect** would benefit from some in-depth tutorials and demonstrations, but the results you can achieve are definitely worth the effort.

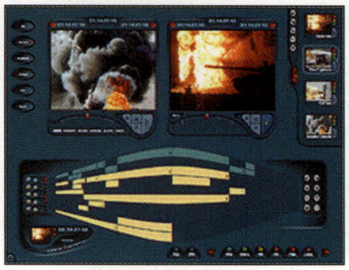
Commotion 2

PC and Mac
£1992
BIT UK
t *01420 838 11*
w *www.puffindesign.com*

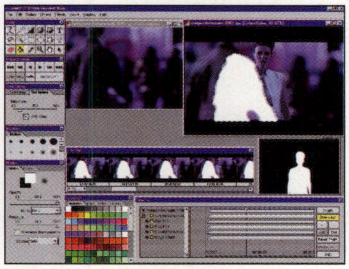
Commotion has been around a fair while now, and this latest version heralds its first foray onto the NT platform. This application is a video effects system with a difference. It enables you to manipulate a video file frame-by-frame. Each frame's treated exactly like a still image, enabling you to paint, mask, filter and motion-map your images to coin your own, highly detailed effects. Although this flexibility means *Commotion* demands a steep learning curve, the results are well worth it.



***EditDV*, until recently a Mac-only program, comes with its own FireWire interface card for a very attractive price.**



***Judgement* from Eidos Technologies has been a long time coming. It's perhaps too early to draw any conclusions on it.**



***paint** is kind of a companion program to *effect**, but offers vector-based bitmap effects and all manner of cleverness.**

£2000 and up

Speed Razor

NT only
£1175-4113 (software only)
In-Sync UK Limited
t *0171 287-6070*
w *www.in-sync.com*

Speed Razor's an editing and compositing package that offers real-time playback for multiple video effects layers, and up to three 3D DVE video clips at one time. You can also play back 32-bit TGAs and other still sequences in real-time. In conjunction with fast editing and plenty of creative effects tools, *Speed Razor* is fully networkable. It can take advantage of multiple processors, thereby speeding up render time, and for economy, you can use *Speed Razor* either on-line or off-line. You can batch capture to the network drive, and edit the files simultaneously from an off-line station – which doesn't need to have video capture hardware installed. The system is also developed with an open architecture, making it pretty flexible with hardware. *Speed Razor* supports a wide range of professional video capture cards, including high-end dual-stream video capture hardware, like Matrox's extremely popular DigiSuite.

Trinity

$8,000-10,000
Play
w *www.play.com*

Trinity is a hybrid of hardware and software, resulting in a complete film production suite in one box. Play spent eight years developing *Trinity*, which took 22 custom processors and a million lines of software code to come to fruition. So, was it worth it? Well, *Trinity's* the world's first multi-channel, network quality digital production suite, which promises to add whizzy 3D digital effects to your footage, offer on-line post production tools, and provide on-air live broadcasting. The latter is achieved by the powerful digital component switcher, which also provides real-time performance for post production work. Advanced features include seamless integration with animated graphics from Panamation and TitleWave, automated operation via visual timelines, and independent colour correctors on each input. *Trinity* promises to be the next generation in non-linear broadcast quality editing and effects – and at a quite astonishing price.

edit* 5.0

NT only
£5816 (edit plus £9394)*
Autodesk
t *01483 462 600*
w *www.discreet.com*

*edit** is another fine package from Discreet – a real-time, non-linear editing solution which enables you to composite, perform keying and add visual effects from your desktop. It's a powerful tool, offering 99 video tracks and 48 audio tracks for complex compositing in 2D or 3D. It's also fully compatible with *paint**, *effect** and *3D Studio MAX*, and offers support for variable compression ratios, including full resolution uncompressed graphics.

high-end

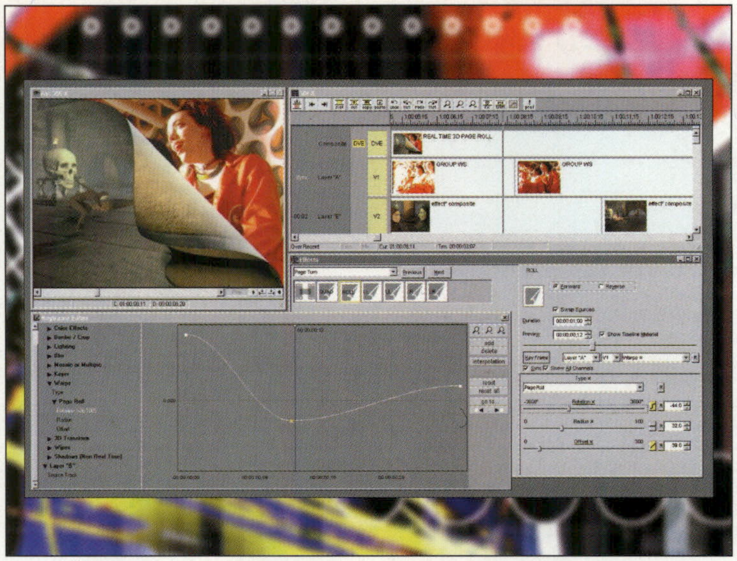
flame*

SGI UNIX, Onyx 2 and Octanes
£246,750 (Version 6 on Octane)
Discreet
t *0171 314 6600*
w *www.discreet.com*

Used by top post-production houses like Rushes and Glassworks, *flame** has more than proved its credentials on pop promos, films and adverts. It uses an open architecture platform, and its significant tool set can be augmented with *sparks** plug-ins. Easily integrated into any facility, *flame** really is the ideal tool for creating visual effects for high-end, high-profile broadcast films. You'll need some powerful SGI hardware to run it and it's not in the least bit cheap, but for professional work there's little to match it.

fire*

SGI UNIX, Onyx 2 and Octanes
£528,750 (version 3 on Onyx 2 Rack)
Discreet
t *0171 314 6600*
w *www.discreet.com*



The release of Play's *Trinity* marked a new era: it provided a complete broadcast edit suite for around $10,000, thanks to some nifty custom hardware and software. Watch out for the forthcoming Trinity NLE, which offers real-time editing facilities.

*fire** is a hefty package. It offers an extensive editing and finishing tool set, designed specifically for editing non-compressed video, with full support for resolutions ranging from 601 to HDTV. This is an industry leader for post-production work, and as you would imagine, it has some tasty features. One of the most valuable is an ability to access non-linear material, while working in real-time. This instant feedback is essential for artistic experimentation, and makes client-based editing sessions possible: you can try out ideas before their eyes. It also features a fully integrated set of image enhancement, character generation and digital video effects tools – all in a true 3D environment, processed at full-bandwidth RGB. This reduces the need to off-load graphics or effects work to other dedicated stations. Add complete support for PAL, NTSC and ATSC Digital Television formats, and you can see why this package is used so extensively in high-end post-production environments the world over.

inferno*

SGI UNIX, Onyx 2 or Octanes
£564,000 (Version 3 on Onyx 2 Rack)
Discreet
t *0171 314 6600*
w *www.discreet.com*

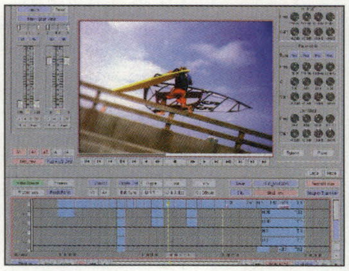
Particularly suited to film and HDTV, *inferno** is a special effects package and a half. Featuring the tools essential for work at higher bit-depth per colour channel and spatial image resolution, it offers full support for video, video-to-film, film-to-video, and film-to-film production cycles. *inferno** is widely used by professional facilities.

Film Composer

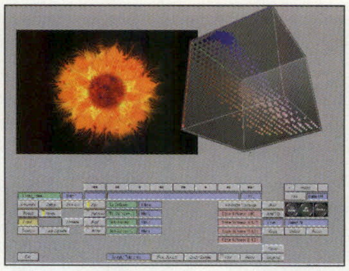
NT and Mac
£59,925 (NT), £54,050 (Mac)
Altered Images
t *0181 568 4466*
w *www.avid.com*

Avid's *Film Composer* is an award-winning package which enables you to digitise, edit and play back your film projects at a true 24 frames per second. At the heart of Avid's family of film editing and finishing products, *Film Composer* promises to streamline the film post-prod process. This includes logging and telecine transfer, film editing, audio editing and mixing, and storage and networking solutions. Editing features include an interactive timeline, full screen editing and playback, and frame-accurate trimming. The NT system is based on the Meriden card, while the Mac version based around the ABVB card. The prices for both systems exclude any storage devices or peripherals; again, it seems expensive, but not in the professional environment, and not for the Avid name. **ca▸s**

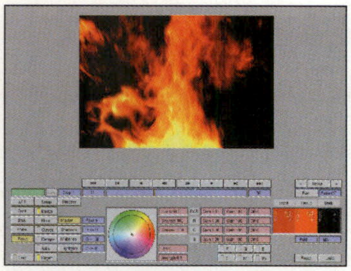
Play's *Trinity* provide a complete broadcast edit suite for around $10,000, thanks to nifty custom hard- & software.



***fire** is one of Discreet's professional high-end applications used by post-prod houses the world over...**



...as is *inferno, an even more expensive package. Many Hollywood movies absolutely rely on this software.**



***flame**, meanwhile, while being (relatively) cheaper, is probably the most widely-used of the Discreet packages.**

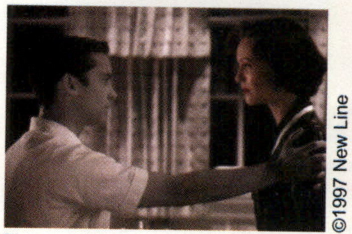
commotion™

version 2.1

Keep up with your imagination

With support for Macintosh® and Windows NT®, Commotion™ is a comprehensive visual effects package for professionals working in video, film, and digital content creation. Whether you are doing corporate video design or motion picture effects, Commotion's creative integrated tools are what you need to turn your vision into reality.

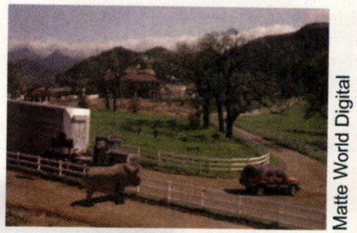
First Union Bank Spot
Industrial Light and Magic



Pleasantville

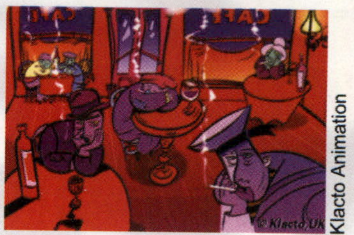
©1997 New Line

- **Image Editing and Effects**
- **Powerful Rotoscoping**
- **Integrated Motion Tracking**
- **Natural Media FX Brushes**
- **3rd Party Plug-in Support**



Mighty Joe Young

Matte World Digital



Pett Cafe

Klacto Animation

Distributed by:
BIT (UK) Limited
Normandy House,
Nether Street, Alton,
Hants, GU34 1EA.

T: **+44 (0) 1420 83811**
F: **+44 (0) 1420 80657**
E: **sales@bit.co.uk**
W: **www.bit.co.uk**

IBC Stand: 7.222

PUFFIN DESIGNS

Bit

Kraft Singles Spot

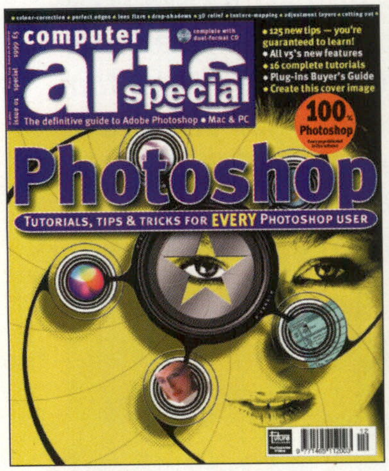
Reality Check Studios

computer arts special
The definitive guide to digital video • Mac & PC

cas04

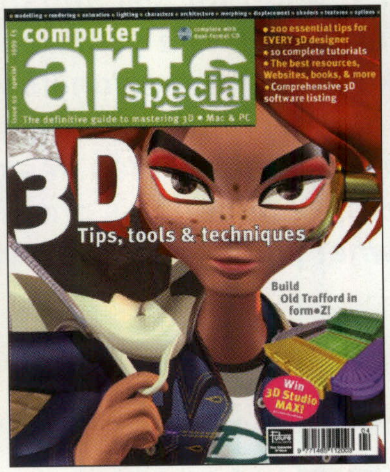
back issues

For back issues, call the hotline number below. They cost £6 per issue*



Computer Arts Photoshop Special – COSB0001
100 pages dedicated to *Photoshop*. Includes 125 tips for all *Photoshop* users, plus 16 complete tutorials covering Menus and Palettes, Selecting, the Rubber Stamp, Re-sizing, Blurring, Colouring B&W images, Colour-correction, Adjustment layers, Edges, Photo-manipulation, Drop-shadows, 3D techniques, Texture-mapping and Metal Effects. **CD** Mac and PC demo of *Photoshop 5*, plus demos of the 10 best *Photoshop* plug-ins and support files for all the tutorial articles.

Re-printed due to demand!



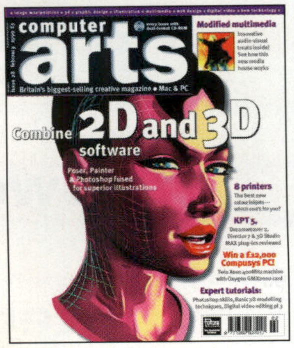
Computer Arts 3D Special – COSB0002
The definitive guide to mastering 3D, including 200 essential tips for every 3D designer, and 10 complete tutorials, which you can tackled in many applications on any platform. There's also a comprehensive 3D software Buyer's Guide, plus book reviews, online resources and more. **CD** FREE fully-working software: *Strata Vision3D 4* (Mac), *trueSpace 2* (PC). Plus *Cinema 4D GO!* (fully-working for 90 days), *Amapi 4* (fully-working for 60 days), loads of software demos – and £2420's-worth of Viewpoint wireframe models FREE!

Hurry, while stocks last!

Computer Arts 3D Special – COSB0003
Want to get yourself on the Web? This Special tells you exactly how. Get to grips with *Dreamweaver 2*, learn how *Fireworks 2* can optimise your Web images, and uncover *Flash 3*'s awesome power. Plus many more techniques for colour palettes, graphics compression, navigation and layout, and more. **CD** 30-day full software: *Dreamweaver 2, Flash 3, Fireworks 2, Beyond Press 4, Home Page 3, NetObjects Fusion, ImageStyler, PageMill 3, PhotoTools 3, VisualPage* (all dual). Plus demos, Web links, resources and more!

Issues still available!

Issue 27 – Code CA027
Amapi 4 and *Rhinoceros* reviewed.
CD *Premiere 5* and *form•Z 2.9.5.*



Issue 28 – Code CA028
Poser, Painter & *Photoshop* tutorial.
CD *Photoshop & Premiere 5* demos.

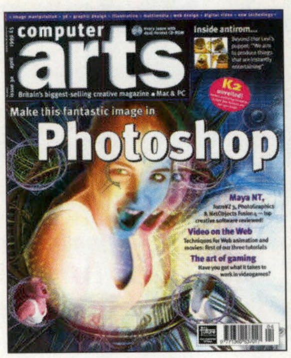
How to order back issues:

Call the hotline on
+44 (0)1458 271 108

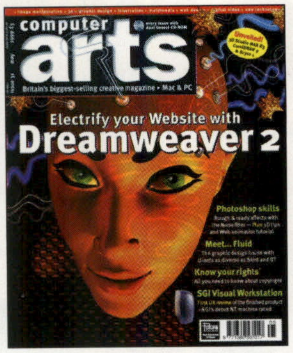
Or via e-mail
subs@futurenet.co.uk

Please quote code: **COS04**

* Postage free in UK only. Add £1 per issue for European orders. Add £3 per issue for the rest of the world.

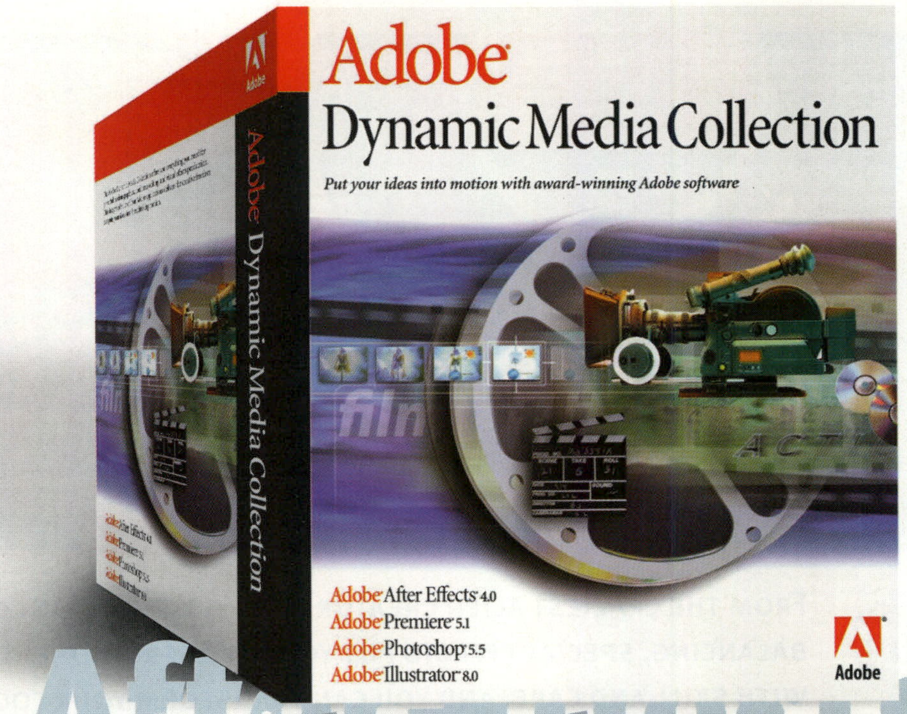


Issue 30 – Code CA030
Photoshop and Video on the Web tutorials, plus *Maya NT 1* reviewed.
CD *Photoshop 5, form•Z 3* demos.



Issue 31 – Code CA031
Dreamweaver 2, Photoshop Noise and Modelling hands in 3D tutorials.
CD *Dreamweaver 2, VectorWorks* demos.

Issue 32 – Code CA032
Digital Video, plus *form•Z* insect model and 3D figure tutorials.
CD *QuarkImmedia 1.5* and *form•Z.*



Win an Adobe bundle

WIN A COMPLETE VIDEO & FILM PRODUCTION SUITE – WORTH MORE THAN £1500 – COURTESY OF Adobe

Time and again you'll see one company name mentioned throughout this Special. That company is Adobe, which just happens to produce some of the finest (and widely-used) digital video editing and effects tools available.

Realising this, Adobe has bundled four of its most popular DV applications, slashed their collective price and called it the *Dynamic Media Collection*.

First up there's *Premiere 5.1*, possibly the most popular desktop video editor available today. *Premiere* offers world-class non-linear editing capabilities with its robust interface and wide range of tools. It's the ideal companion for *After Effects 4.0*, a dedicated special effects package capable of astonishing results and with an enormous range of plug-ins available.

Photoshop 5.5, meanwhile, is *the* standard image-editing software (we're not averse to writing about it in CA every now and again…). This brand new version incorporates *ImageReady 2*, a dedicated Web graphics editor. Couple that with *Illustrator 8.0*, the leading vector-based illustration software, and you have a complete solution for creating backgrounds, painting frames, rotoscoping, adding type effects and so on.

The *Dynamic Media Collection* has an ASP of around £1500, which is a bargain in itself. However, why pay when you have the chance to win one entirely free by entering this competition?

The competition

The *Dynamic Media Collection* contains four applications. But which version of *Premiere* is included?

A – Version 4.3
B – Version 5.1
C – Version 17

To enter

Try the easy way via the Web:
1) Insert the Web Special CD
2) On the Contents screen, click 'Current Compo'
3) Put 'Adobe Collection' as the competition name, fill in the rest of the form and click 'Submit Entry'.

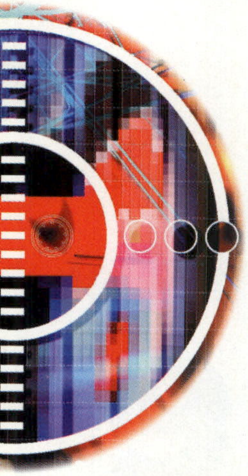
Alternatively, if you don't have Web access you can submit your entry on a postcard to:
Adobe Collection competition
Computer Arts Specials, Future Publishing,
29 Monmouth Street, Bath, BA1 2DL.

State whether you're **PC** or **Mac** based, and remember to include your address and a daytime telephone number if possible.

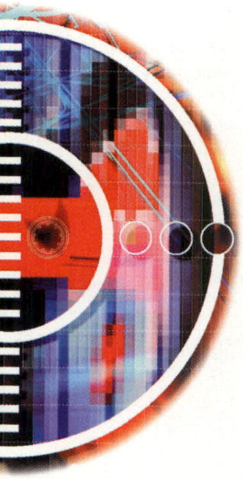
The rules

Closing date for all entries is 31st October 1999. Employees of Future Publishing, Adobe, their agents, or their families may not enter. No multiple entries will be accepted. The editor's decision is final, there are no cash prize alternatives, and no other correspondence will be entered into.

Special effects



[TUTORIAL]
SOURCE
EDIT
COMPRESS
EFFECTS



FROM THE CRAZIEST ALIEN CREATURES TO THE SUBTLEST COLOUR BALANCING, SPECIAL EFFECTS PUT YOU IN CONTROL. USE YOUR EFFECTS WITH SKILL AND CARE, AND YOU CAN TRANSFORM YOUR FOOTAGE...

When it comes to adding special effects to your digital video, you might be wondering if there's any point. Maybe you're determined to make a gritty cinema verité documentary that eschews big-bucks Hollywood pyrotechnics – or maybe you just feel that there's really no place in your film where they could be useful.

Not just aliens

Well, think again. 'Special effects' doesn't necessarily mean huge explosions and enormous spaceships flying down an urban street. Some of the best special effects, like those in *Citizen Kane*, are so well done you don't even realise they exist. SFX enable you to add things that weren't there when filming, tweak the look of each individual frame if needed (altering colour balance, contrast and so on), play with the lighting, or just stabilise some shaky camera work. They can even stretch to adding noise and imperfections to the otherwise pristine digital video format, making it look more like film.

In this *Special*, we're assuming you're adding the effects after the editing process, which kind of makes sense – after all, you don't want to spend hours creating something wonderful only to edit it out later. However, with some projects you might find the editing/effects process to be more interchangeable; the need for some effects might arise *because* of editing, for example. In the end it all depends on your way of working.

An FX dream

Of course, because you're using digital video from the word go, you're spoilt for choice when it comes to adding effects. Incorporating rendered 3D animation, for instance, is a doddle in most packages, as is fiddling with colours and retouching frames. And, because it's digital, there's no chance of generation loss as you add multiple layers of effects.

As usual, there are several packages available that offer special effects of some sort. But by far the most popular on the desktop is Adobe's *After Effects*. The latest version 4.0 is a real cracker, offering a whole raft of functionality, but crucially it's also bolstered by an enormous collection of plug-ins, ranging from the essential and general purpose to the extremely specialist. Chances are, if you need an effect, there's an *After Effects* plug-in for it.

But you probably won't use *AE* exclusively. 3D packages can also come in handy, as can *Premiere* (or whichever editing package you're using), a bitmap editor like *Photoshop*, 3D painting programs, or just about anything that will get the job done.

And let's not forget the audio side of things. Though we haven't the room in this *Special* to go into it in detail, adding foley (audio effects), editing dialogue and smoothing out ambient sound can be vitally important. If you're not doing too much in this area already, you can probably get away with using your editor's or effects package's built-in audio capabilities before shelling out even more.

The plan

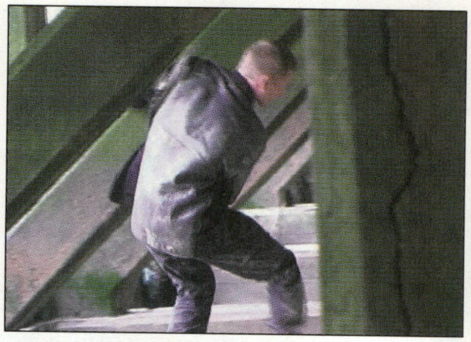
Over the next few pages we'll walk through some 'classic' special effects and how you can achieve them without too much work, on a desktop PC or Mac using *AE*. The final result, while being way over the top, at least shows how effectively you can turn simple footage into something altogether different: a typical sci-fi chase sequence in which a man is stalked by aliens. See Chase.mov on your cover disk for the finished scene, and most of all, enjoy... ca>s

Information

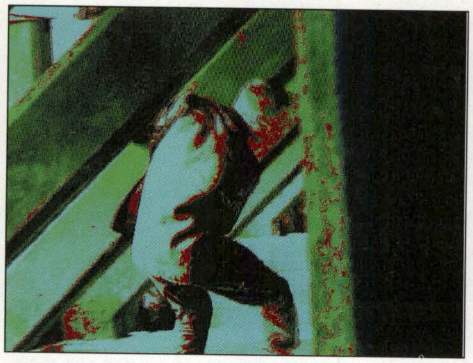
You'll find the movie we made for this tutorial, Chase.mov, in your cover CD's root directory.

Stage one: Point of view

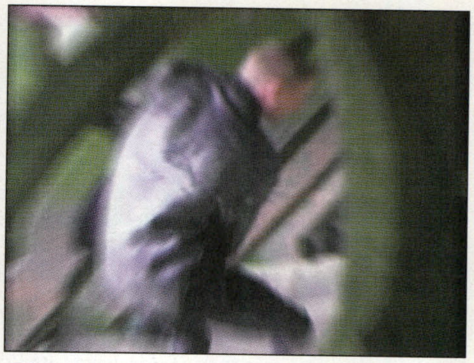
No good sci-fi chase would be complete without a sinister look through the alien's eyes, where everything looks different...



1 Pick your shots. You should know as you're editing (and when you're shooting) when the camera is to be an observer, and when the viewer is to be looking through the eyes of one of the characters. POV (point of view) shots are usually shot hand-held, and can be a little more shaky than other shots.



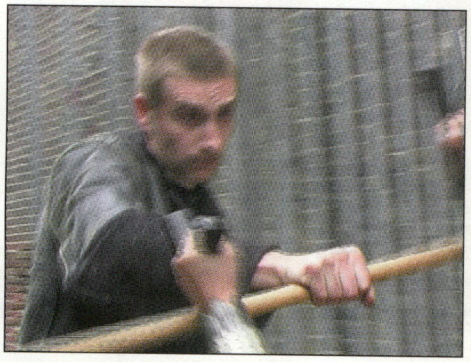
2 Apply some filters. *Premiere* provides a whole range of filters, which you can combine to produce strange effects. We've bumped up the contrast, altered the colour balance, and used Colour Replace to add red highlights to the shot.



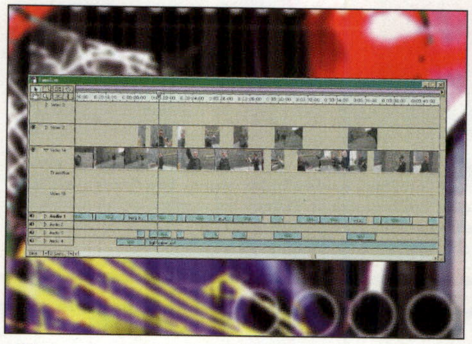
3 As an optional extra, you could produce an overlay. Some kind of head-up display, if properly animated, can look good for a machine's POV. Alternatively, you could use a lens distortion effect for something more organic.

Stage two: Light fight

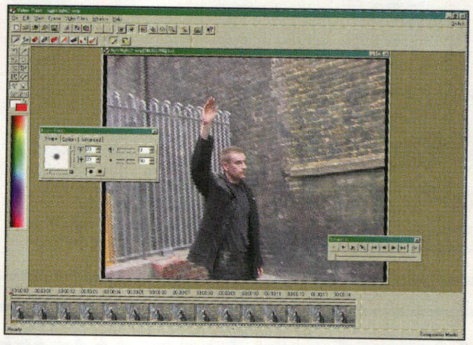
We're aiming for a variation on the classic light sabre battle, but this time we're using batons and staves for the fight...



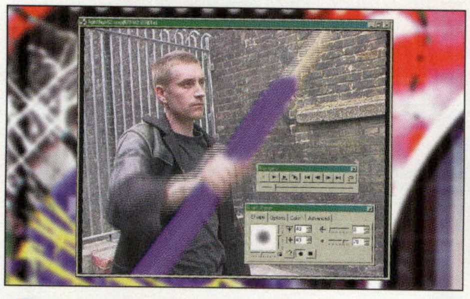
1 Shoot the fight scene. We've used two people, both used to training with the weapons in question. We choreographed the scene, and practised at slow speed before filming. Wooden weapons elicit the right movements and balance from our actors.



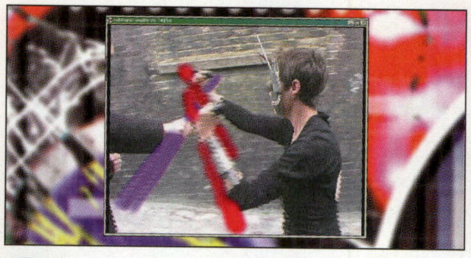
2 Edit the scene. It stands to reason that if your fight doesn't look good before you add effects, then it's not going to look much better afterwards. Use plenty of close-ups and think seriously about angles, and you'll get a better scene. Once finished, we rendered the sequence as a complete file.



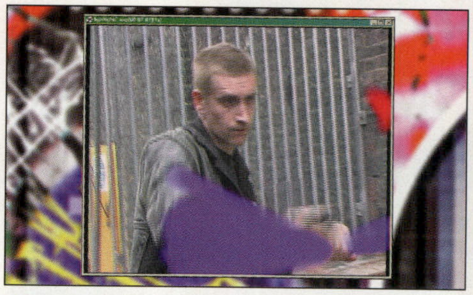
3 Using a video painting program, you can begin to add the effects. We used Ulead's *VideoPaint*. The program enables you to load in a video file and work on it frame by frame. A variety of painting and cloning tools enable you to manipulate the video in whatever way you like, but it can take a long time.



4 Using the airbrush tool with a suitably electric colour, we can begin to paint in the light weapons. Step through the fight scene one frame at a time, using the wooden sticks as a rough guide to paint on the effect. Remember, it doesn't have to perfect.



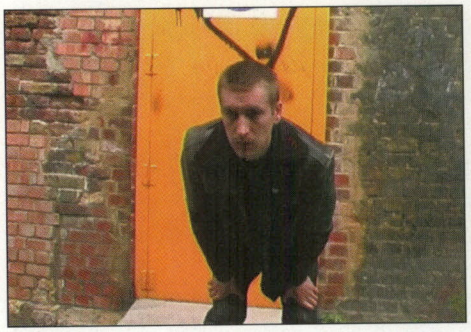
5 This will be a long job – with 25 frames per second, if you take a minute for each frame, it'll take you 12 hours to complete a 30-second scene. Luckily, you don't have to be too careful with each frame. Small inconsistencies in the strength of the beam merely create a flickering, pulsing effect, which can look good (as long as it's not too extreme).



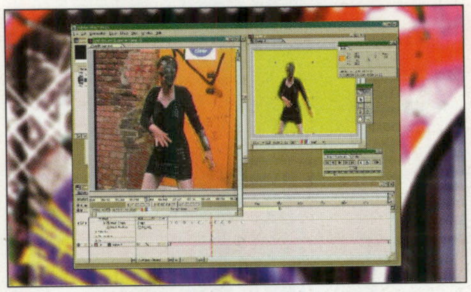
6 For shots where the weapon's moving fast, we've created a large, blurry beam. This helps to add movement to the scene, giving the action more punch. When finished, render the scene, and you can import it back into your edited production.

Stage Three: Transformation

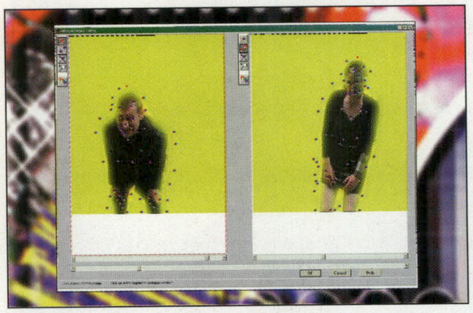
For this shot we want to see a character stepping out of someone else's body, using a mixture of morphing and mixing...



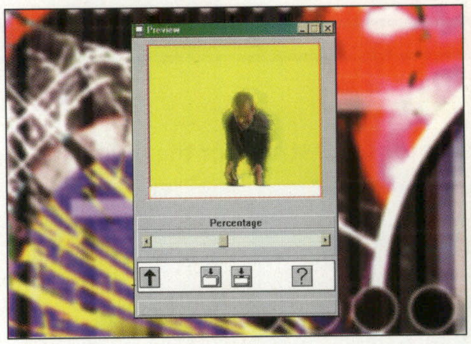
1 We placed the camera on a tripod, locked off so it can't move. Then we took two shots: one of the first actor crumpling to the floor, the other of the second actor starting from the same position, and stepping to the side.



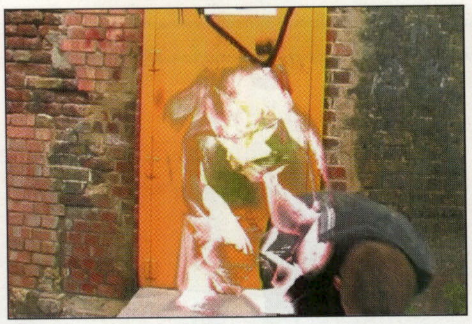
2 When we apply the effects, we want them to affect only the figures – not the background. So it's necessary to create separate layers with only the figures in place. *After Effects* comes in handy here. You can use masks to create a rough outline of each figure, then animate the masks to roughly follow their motions. Again, this can be a slow process.



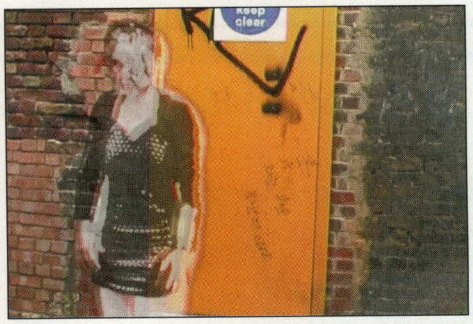
3 Using a morphing package like *PhotoMorph*, you can create a warp from one figure to the other. First place morphing points all around the first figure, then move them to the corresponding position on the other figure. By stepping through the video, you can position the points at intermediate frames.



4 We haven't worried too much about creating a perfect morph – it's supposed to be a little surreal. Also, the morph won't be used on its own, but combined with other effects for the final shot.



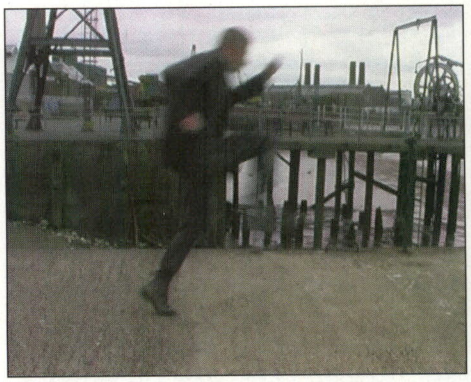
5 We now import the morph into our editor, and use blue-screen transparency to superimpose it over the initial shot. Filters are applied to the morph to make it slightly ghostly – increasing the brightness and contrast so that the effects look ethereal.



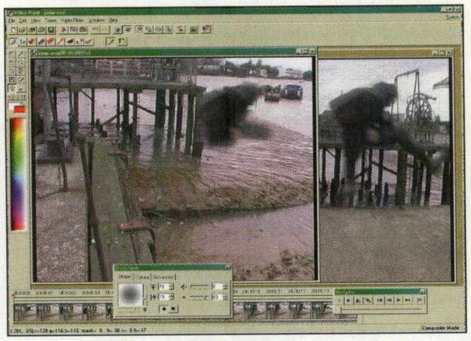
6 Finally, as the first figure drops out of shot and the morph comes to an end, we mix in the shot of our second figure, so it seems to be growing out of the morph. A simple cross dissolve transition achieves this with the minimum of fuss.

Stage Four: Leap of faith

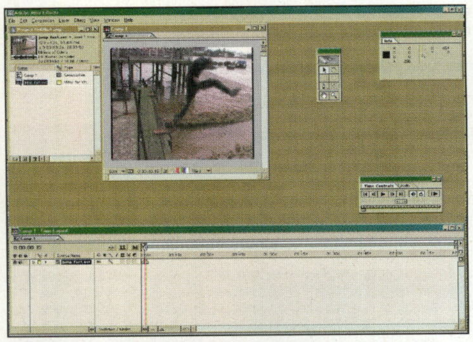
For this shot, we want our hero to leap from the top of a high structure. We have no stunt budget, so it's down to effects...



1 We took two shots: one of the actor running and leaping on a flat surface, and one (from the same angle and height) of the precipice he'll appear to jump from.



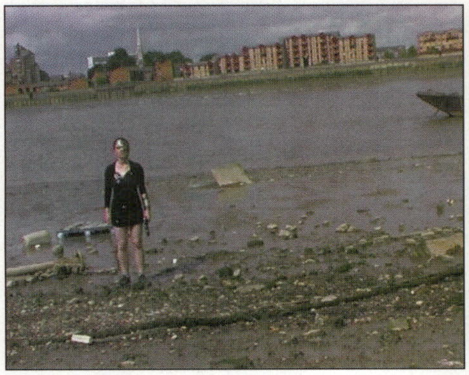
2 Both shots are loaded into Ulead *VideoPaint.* Using the clone tool with a soft brush, we advance one frame at a time through each video, cloning the figure only from the first shot into the second shot. There are only about 20 frames, so it's not such a long job as it might seem.



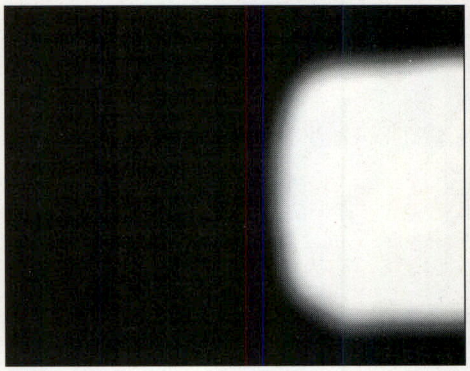
3 The finished shot is slowed down for effect (with *After Effects'* Time Stretching, you can achieve a smoother slow motion effect). And we cut it together with another shot of the actor jumping from a couple of feet off the ground. The result is pretty convincing – check out Chase.mov on your CD.

Stage five: Beam in

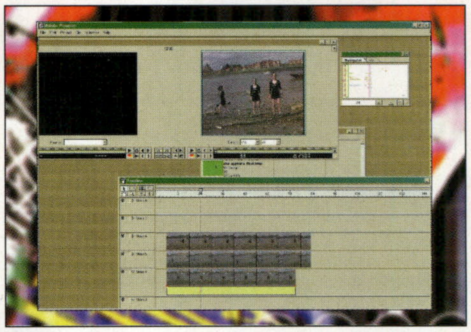
We want the illusion of three identical characters materialising from thin air, using a composite of several shots...



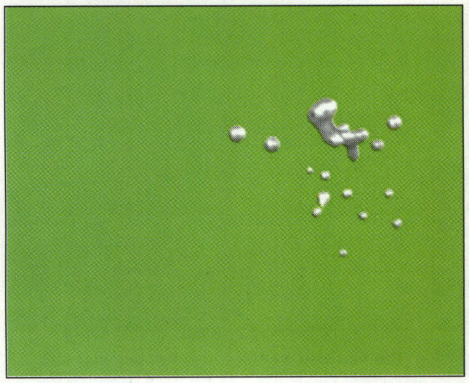
1 First, shoot the scene four times using a tripod-mounted camera. Three of the shots contain the materialising character in different parts of the shot (we were careful to position them so they never overlapped each other). The third shot is of the same scene, but empty – this is important.



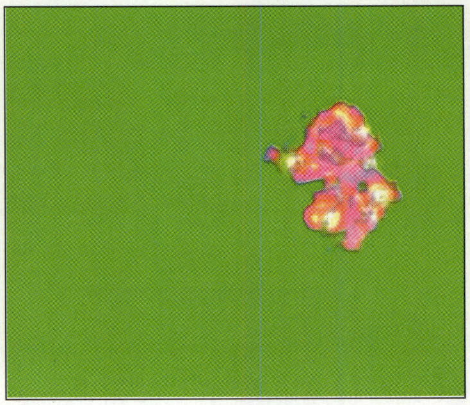
2 Using *Photoshop,* create a soft-edged black-and-white matte from a still of each character. The white area indicates where the character will be standing. Use a soft-edged airbrush, because when you combine the three shots into one, you don't want it to be obvious where one shot begins and the other ends.



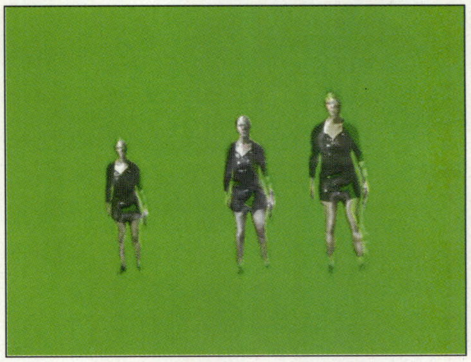
3 Going into *Premiere,* you can use the empty shot as a background in one track, then in higher video tracks, place the other three shots with the actor in place. Now right-click on each, and set the Video/Transparency option to Image Matte. You can now choose the relevant matte from the previous step. With this done, render the sequence to see your three characters in the same shot.



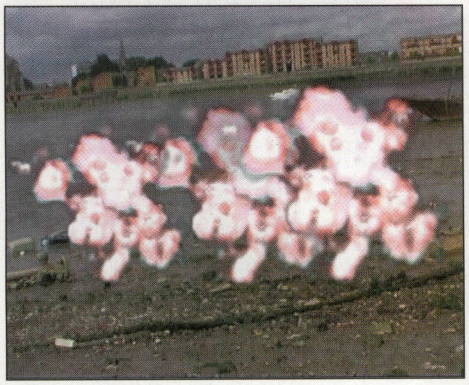
4 Now for the materialisation effect – we're using *3D Studio MAX.* Using a particle cloud formed from meta-particles, we've created a kind of explosion of liquid metal. The blob disintegrates, flying out in all directions.



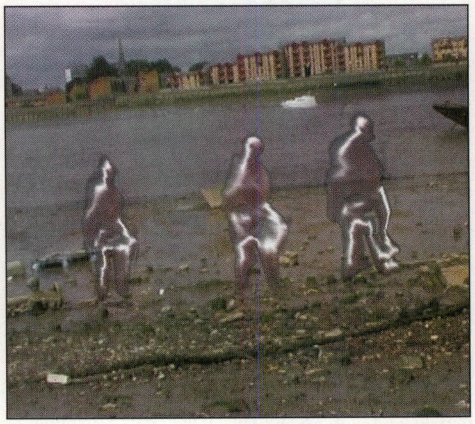
5 We've also used a *Pyrocluster* smoke effect laid over this, to render an explosion. For the materialisation, this effect will be in reverse, so our figure appears out of smoke and meta-particles.



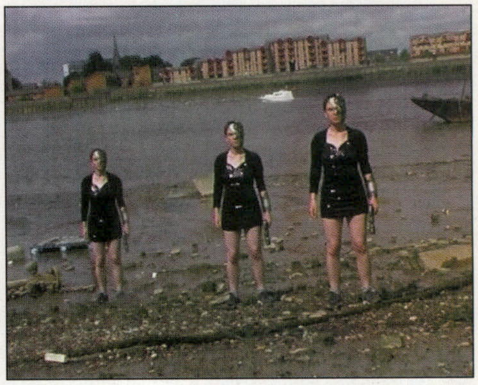
6 Next, we used *PhotoMorph* on the first frame of the *MAX* animation, and a single still of each figure, cut out and placed against a green background. We created a morph from one to the other – the figures are cut out so the morph does not affect the background, for obvious reasons.



7 We can now begin to assemble the effect in *Premiere.* Begin with the empty background shot, and using green-screen keying, overlay the *MAX* animation over it. The animation is reversed so the explosion becomes an implosion.



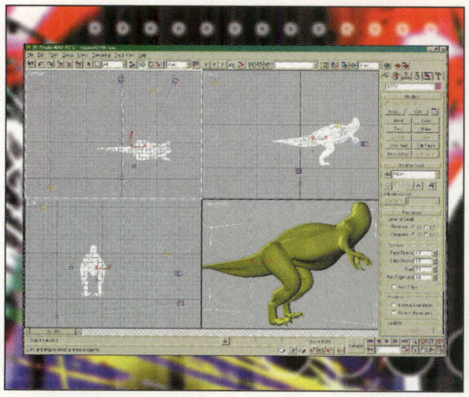
8 Now you can superimpose the morph with the same technique. The join between the effects should be as seamless as possible.



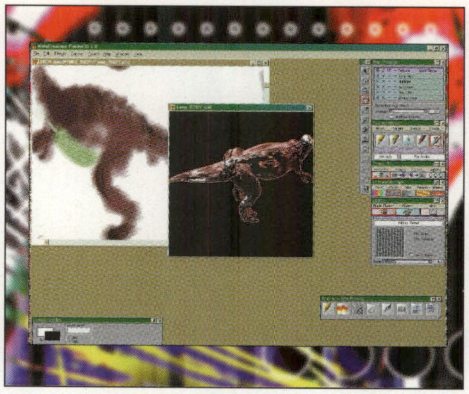
9 Finally, find the end point of the morph – where the characters are fully human – and insert the three character shot from step 3. To smooth the join, you may need a cross dissolve to blend the shots – if your lighting changed during shooting, for example.

Stage six: Monsters

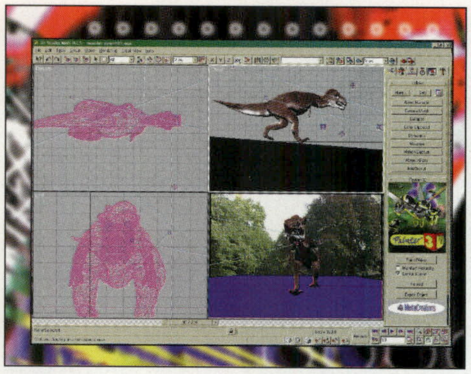
Our hero is recovering in the park, when he looks back to see a T-Rex in hot pursuit...



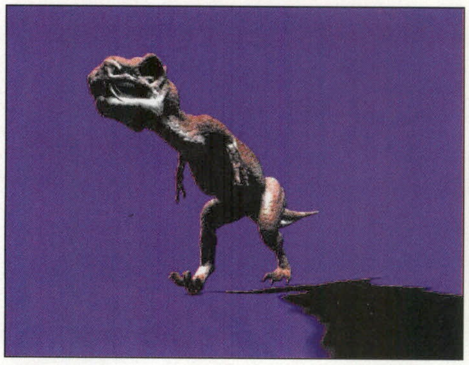
1 Design your T-Rex – we used *3D Studio MAX* with the *MetaReyes* plug-in. *MetaReyes* enables you to build meta-muscles which, when brought close together, merge into smoothly contoured shapes – ideal for organic creatures.



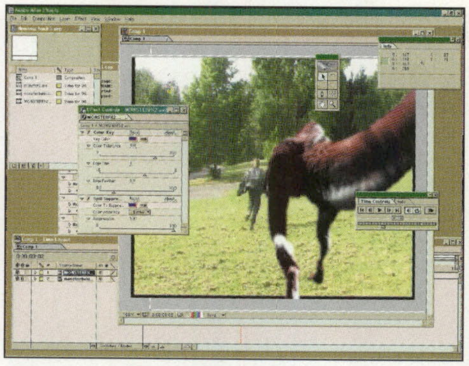
2 Give it realistic colouring. *Painter 3D*, which enables you to paint directly onto a 3D model, supplied our dinosaur's hide. It's easier than using a 2D painting program and trying to line up the textures later, though of course that's an alternative.



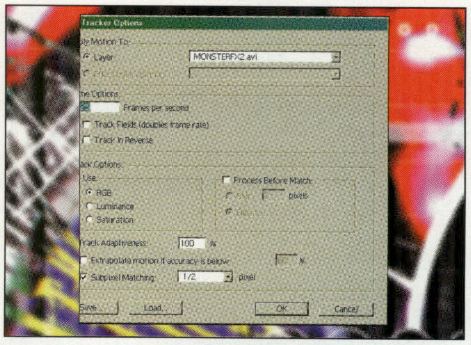
3 Animate the creature. Using *Character Studio*, we turned ours into a biped and placed its footsteps at a slight downward angle, to have it running down a hill. To get the footsteps, positioning and lighting correct, import a frame from your footage as the backdrop in your Viewport.



4 Adjust the camera and lighting to match the scene, and render it against a blue background. You can place a blue box under the creature to act as the ground plane, so shadows are cast onto the ground for a more realistic result. More time to play with our lighting here would have achieved a better effect.



5 Now it's time to composite the shots, and Adobe *After Effects* is ideal for the job. Dragging both the background and the T-Rex animation into a new composition, select the animation, and use Effects>Keying>Colour key to make the blue background transparent, so the background shows up.



Tracker Options

ply Motion To:

○ Layer: MONSTERFX2.avi

ne Options:

Frames per second

☐ Track Fields (doubles frame rate)

☐ Track In Reverse

ack Options:

Use:

● RGB

○ Luminance

○ Saturation

☐ Process Before Match:

pixels

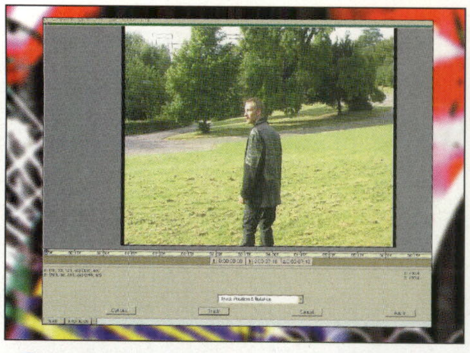
Track Adaptiveness: 100 %

☐ Extrapolate motion if accuracy is below %

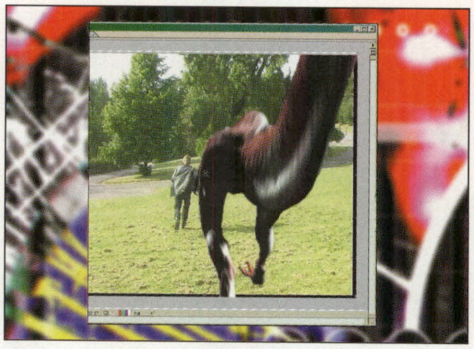
☑ Subpixel Matching: 1/2 pixel

Save... Load... OK Cancel

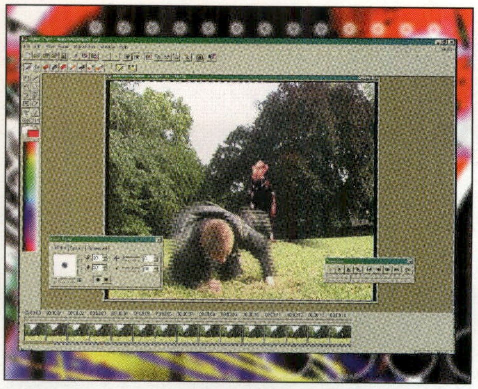
6 The dinosaur's in-shot now, but the shot was hand-held and shaky – so we need to match the monster animation to the camera movement. The *After Effects Production Bundle* includes a tool for motion tracking, which we'll use here. Select the background shot, and use the Keyframe Assistant to bring up the Motion Tracking window.



7 Here you can choose to track rotation, position or both. Use both to create a motion path mirroring the hand-held camera. Two boxes are displayed which you can resize and position over your scene – place them on high-contrast areas of the picture (to aid tracking recognition), but keep them horizontally aligned with each other.



8 When you now hit Track, the motion of the images in these boxes is traced frame by frame to create a motion path. Hitting Apply applies that motion path to the animation, so the T-Rex animation moves with the rest of the picture. Adjusting the dino's anchor point positions it in the correct place on the screen. Now we can render the shot.

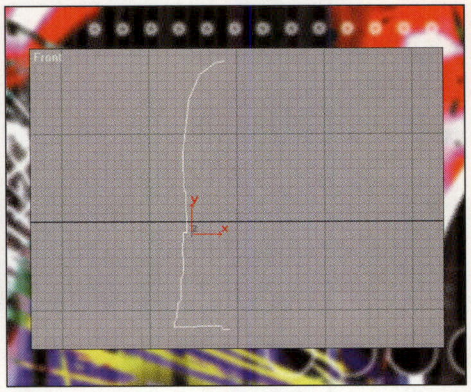


9 Finally, in one shot, our hero needs to run in front of the creature. Importing the finished scene into Ulead *VideoPaint* along with the original, unaltered scene enables us to clone the actor frame by frame from the raw footage back over the dinosaur.

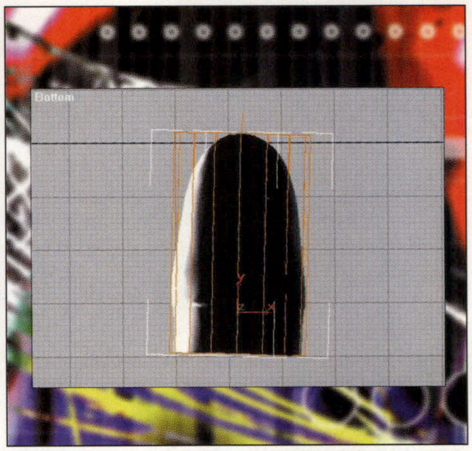
Stage Seven: Splitting bullets

An impressive shot that's quite easy to do: our hero slices a speeding bullet in two with his sword...

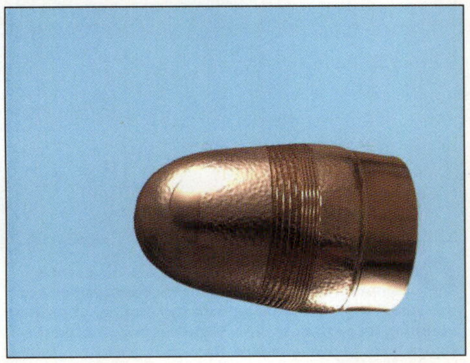
1 **This scene's made up of a number of short shots. First, the bullet leaving the gun, shot as a close-up where the actor slowly jerks the gun as though experiencing its kick. Second, the bullet flying through the air, where we simply whisk the camera around in a semi-circle. And finally, a coup de grâce as the bullet is split.**



2 **Using *3D Studio MAX* or suchlike, design a bullet. Try the Internet for images to base your projectile on, then load one into your Viewport background for reference. Using the Line tool, draw half way around the bullet image.**

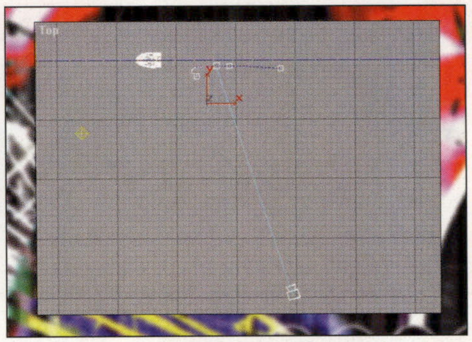


3 **Then you can just lathe the line to create the finished shape, and apply a chrome material.**

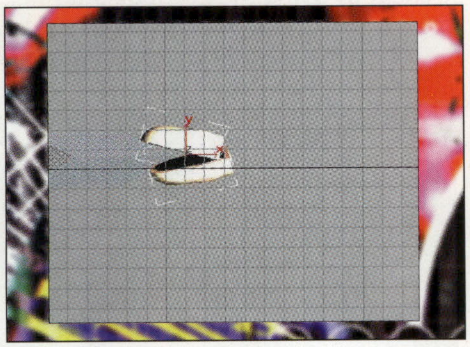


4 **Fine-tune the material and replace the reflection map with your background footage, so the bullet reflects its surroundings. Try a noise map to give your bullet a slightly pitted look, and a striped image map for grooves and colouring, for added interest. Don't get too picky though – it's only small.**

5 **Next, add lighting to illuminate the bullet, with your original footage used as a backdrop in the Camera Viewport. Sometimes perfectly-balanced lighting on a computer model looks too good to be real, so we used high-strength lights to bleach out the top of the bullet for an ultra-shiny effect.**



6 **For most of the shots, the animation is quite simple. The bullet travels in a straight line, spinning all the while – all you need is to line up the camera view and perspective with the background shot. We had to pan the camera with the bullet for some shots, but since the object's flying and the background is a blur, precise matching wasn't vital.**



7 **The splitting scene was slightly more complex. We divided the bullet in two and set it moving. We then created a prism object, positioned it where the blade touched the bullet, and made it completely transparent. Finally, we used *MAX's* Dynamics function to model the effect of the collision between the bullet parts and the prism. (This is a little over the top...)**

8 **The animation is rendered using the original footage as the background. We could have used a blue screen, then superimposed it in *Premiere*, but it would have just added an extra step.**

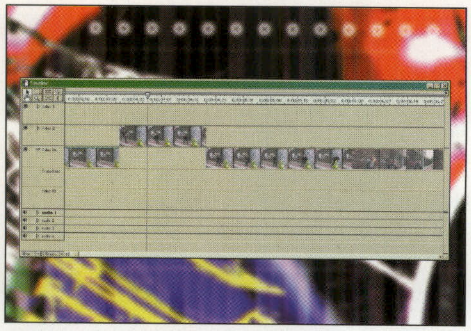
9 **Finally, we used Ulead *VideoPaint* to paint parts of the original video footage back onto the effects shot. This was so the bullet appears to come from within the gun, and when it splits in two, one half can disappear behind the actor's face.**

Stage eight: More materialisations

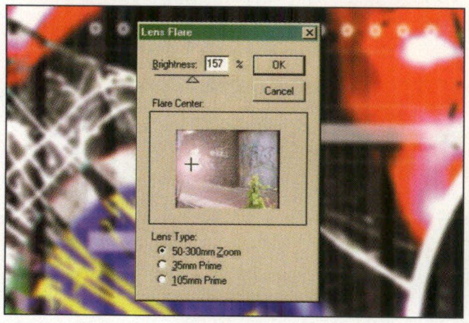
Here we want a simpler way to materialise and de-materialise our hero – quick but still effective...

1 Shooting here was a little haphazard. In some shots, the actor simply leapt, fell or ran into shot. In others, the camera was hand-held and shaky. This makes life difficult for the effects engineer.

2 Because we can't separate the figure from the background without a great deal of work, the effect will have to be applied to the whole screen, not just the actor. The trick is to find an effect that will make this seem convincing.



3 We'll do this almost entirely within *Premiere*, and lens flare is effective for creating a flash of light. Using the Razor tool, cut a second or so from the scene the character appears in – this clip can have the filter applied without affecting the rest of the shot.



Lens Flare

Brightness: 157 %

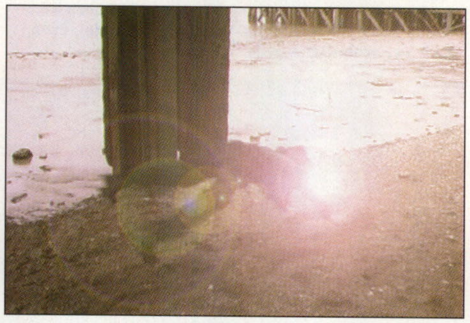
Lens Type:

● 50-300mm Zoom

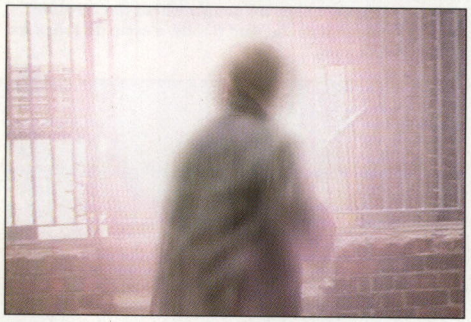
○ 35mm Prime

○ 105mm Prime

4 Add the lens flare (right-click the clip and select Filters>Lens flare), then we can start to animate it. Clicking the timeline in the Lens Flare window enables you to set brightness and position for the effect at any frame.



5 Here, the actor dives onto the ground. We want him to vanish in mid-air. We animate the filter to grow from nothing in the first frame to a point where it fills the screen at the end of the shot. We also moved the effect so it follows the character's movement.

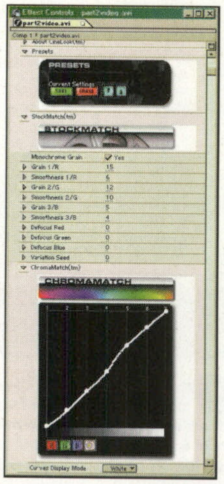


6 In one shot we attempted something more complex. Using *VideoPaint*, we imported one of our vanishing scenes along with the original shot. Then, stepping through both clips together, we painted the figure back in over the lens flare as it grew.

Stage nine: Video to film

Film looks far better than video – but it's both expensive and difficult to work with. So cheat by using the *Cinelook* plug-in...

1 Import your video footage into *After Effects*, and place it into a composition. *Cinelook* (an *After Effects* plug-in from DigiEffects) has two sections. The first is Stock Match, which presents you with a bewildering array of sliders you can use to simulate any film stock's colour, light reaction and grain. Luckily, you can choose from some presets simulating favourite film types.

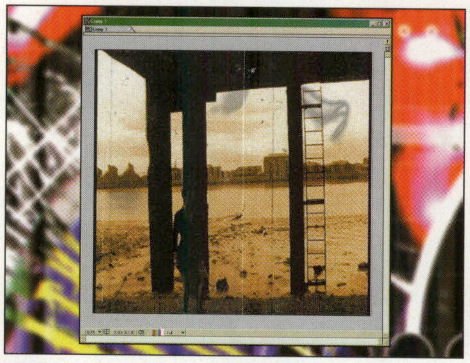


Effect Controls – part2video.avi

Comp 1 * part2video.avi

Monochrome Grain	✓ Yes
Grain 1/R	15
Smoothness 1/R	6
Grain 2/G	12
Smoothness 2/G	10
Grain 3/B	5
Smoothness 3/B	4
Defocus Red	0
Defocus Green	0
Defocus Blue	0
Variation Seed	0

Curves Display Mode: White



2 The other, Film Damage, enables you to add hairs, dirt, focus effects and scratches to make your 'film' look more convincing. Again, you have presets as well as finer controls. Here we've made the damage quite extreme, to simulate rapidly aging film.

3 Once you've played about with the settings, render your finished film. It can take a while – our five minute scene took about 30 hours to render on a Pentium Pro 333 (and that doesn't include the CGI).

computer arts special
The definitive guide to digital video • Mac & PC
cas04

effects buyer's guide

The best effects software on the market – price range £80 to £3000

Flash, bang, dissolve and smattering of subtle lighting – effects are the key to putting professional balance and a portion of the impossible into your films. Here's all the best software for the job...

Eye Candy 3

PC and Mac
£87
Digital Toolbox
t *0181 961 6622*
w *www.alienskin.com*

Alien Skin has been at the forefront of semi-professional graphics for years, in the world of *Photoshop* (its latest set of filters is *Xenofex*). And *Eye Candy 3* is a brand new gift for animators, video and CD-ROM producers. Its 19 effects modify the layer information in Adobe *After Effects* to create fire, smoke and fur effects – the sort of stuff it's very hard to do in any other way, apart from filming it. *Eye Candy* keeps complexity low and creativity high, and manages to output some attractive effects, like overlapping flames and noise. Okay, so these may not equal DigiEffects' exceptional film noise filters, but at just £87 a throw, *Eye Candy* certainly makes for a commendable digital approximation on a budget.

ArtBeats Digital Film Library

PC and Mac
£116-£586
Digital Toolbox
t *0181 961 6622*
w *www.artbeats.com*

The ArtBeats library of royalty-free stock footage is a sign of things to come for the dilettante movie-maker. Professional organisations have been using stock footage for years, and the medium is now making its way towards the amateur. The ArtBeats libraries are some of the most popular, and include volumes of fire, explosions, time-lapse landscapes, and water texture footage that you can, just like stock photography and music, use wherever you want. Such footage was used in films like *Spawn*, and it's a great way to get on film what you don't have the facilities to create yourself. The bonus is that when you're in a pinch, you can quickly whip something up your client thinks is brilliant.

MovieTools

Mac only
$195
McQ
t *00 1 650 348 1344*
w *www.McQPro.com*

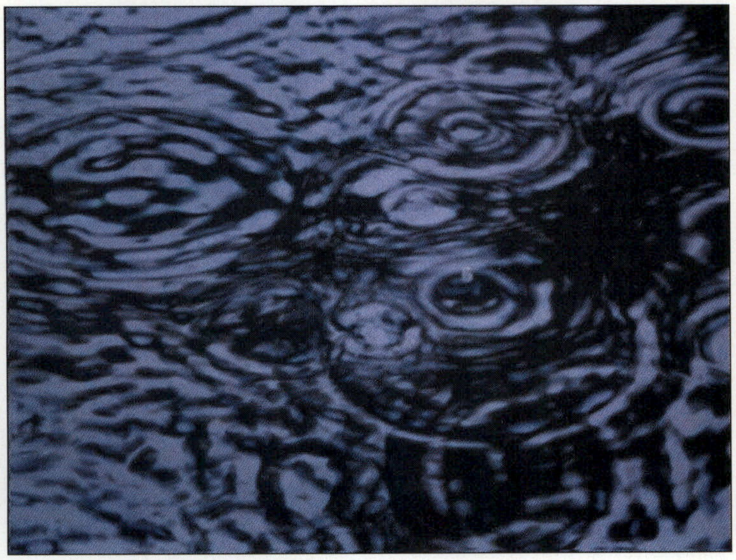
MovieTools is designed with the *QuickTime* author in mind. It's a suite of utilities intended for anyone wanting to tidy up full-size, broadcast quality video, animation and rotoscoping (or frame-by-frame painting). It offers a handful of effects like flipping and rotating, but the true power of this software lies in quality enhancement. Field rendering and interpolation effects clean up the jagged blurring that captured video often displays. It can even create interlacing effects that you can view through 3D glasses.

If you do a lot of rotoscoping, *MovieTools* can split up each frame's two fields and run them end to end, giving a nice clean image to paint on before putting them back together. The company doesn't have distribution in Europe but you can order on-line or download a demo version from their Website.

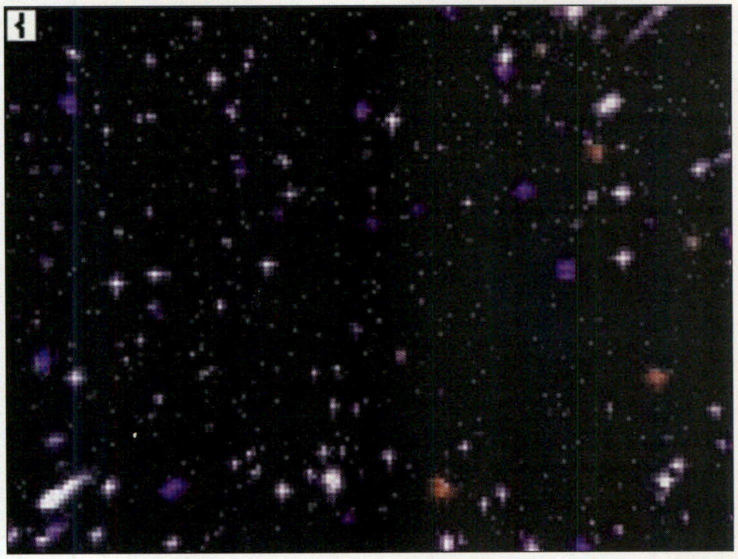
Kai's Power Tools 5

PC and Mac
£129
Computers Unlimited
t *0181 358 5857*
w *www.metatools.com*

Famous for *GOO*, the people at Metacreations have also been making splashes with their video effects filters. These are similarly organic, and range from the traditional – blurring, zooming, spinning and glass reflections – to the simply peculiar – creeping 3D vines, 'four dimensional fractals' and the humbly-titled Infinite Zoom. *Power Tools* effects don't obey the first rule of special effects – that a good effect is invisible. But they do impress through sheer graphical beauty,



ArtBeats Digital Film Library **– cook up something special for your clients in a jiffy.**



Beserk **– starfields galore, but these are no ordinary starfields. They're the best.**

CineLook
Beta SP
CINELOOK AG COLOR XTS 400HS 35MM PRESET

***Cinelook Broadcast* (left) versus Beta SP – *Cinelook* is famous is for film-look filters.**

Alien Skin's *Eye Candy* – a good value *After Effects* plug-ins for fire, fur and the like.

and if it's the super-real you're after, *KPT* is definitely a package to check out.

VideoSpice Rack Pro

PC and Mac
£152
Digital Toolbox
t *0181 961 6622*
w *www.pixelan.com*

It's hard to believe, but for some people the hundreds of transitions that come with an editing package are not enough. Enter the *VideoSpice Rack*. The suite has more than 300 effects that simply swap one video image for another, and with some excellent variations. For instance, you can set your transitions to varying degrees of softness, from cosy blurry effects to harsh *Starsky and Hutch*-style wipes across the screen. Such an effect can feel like a dissolve with direction. The Rack works with pretty much everything from *Premier* to *Media 100*, and several downloadable demonstrations are available at the Pixelan Website.

Beserk

PC and Mac
£234
Polar Graphics
t *0181 868 2479*
w *www.digieffects.com*

Wander into a discussion about animation, and you'll find that one of the most common problems is creating realistic star fields to sit behind spaceships and the like. Known for the *Cinelook* film-look software, DigiEffects also offers the *Beserk* suite, which makes excellent starfields, among other things. It does so by layering stars on each other with different focal qualities, and with some experimentation you can achieve an excellent sensation of travelling, and add gaseous clouds, exploding stars and suchlike. Lots of fun.

Cinelook Broadcast

PC and Mac
£575
Polar Graphics
t *0181 868 2479*
w *www.digieffects.com*

No one has yet managed to surpass DigiEffects' film-look filters. These highly-customisable filters add motion, noise, damage and graininess to the over-perfect video look of DV. Not only do they mimic film grain as an overlay effect, but also monkey around with the layer information to match real-life film stocks from Kodak, Fuji and Agfa, in about 50 combinations. For about the same price, DigiEffects also has *Cinemotion*, a filter that jogs your picture around and adds a flicker to make it look like it's shooting out of a 33mm projector. A classy way to go retro.

Final Effects Complete

NT and Mac
£763
Digital Toolbox
t *0181 961 6622*
w *www.iced.com*

Final Effects is one of those enormous toolsets that you'll dive into, find a couple of favourites and only later – when you realise you're using one per cent of what's on offer – find the manual and learn your way around. The suite includes 50 highly-customisable video effects: distortions, perspectives, stylisings, transitions and the flagship particle effects. *Final Effects* is rivalled only by *Cinelook* in popularity as an *After Effects* plug-in, and that's probably because *Cinelook* is so easy to use. But get your head around *Final Effects'* ways and means, and you'll find it a powerful, creative and well developed package. You won't regret it – though the thought of actually spending some time reading a manual might be painful, it's worth it.

Production Bundle

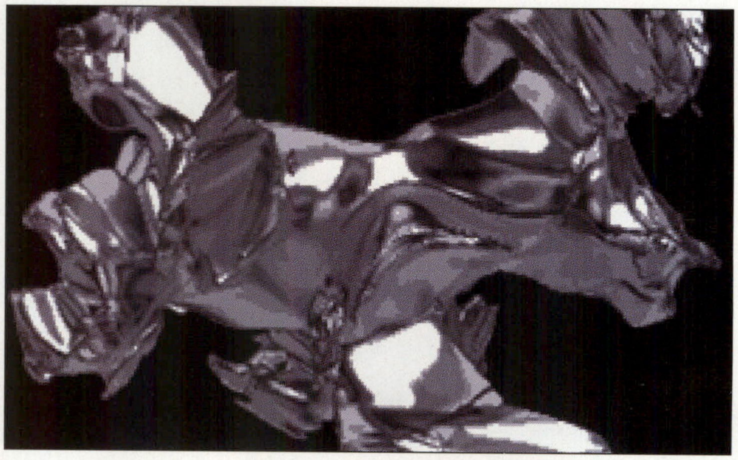
PC and Mac
£1174
Digital Toolbox
t *0181 961 6622*
w *www.adobe.com*

It seems that children's TV would crumple to a heap if it wasn't for bluescreen techniques – when you film a subject against a solid colour background and replace the colour with something else. It's so widely used that it's unlikely you won't try it yourself at some point. Among the many features of Adobe's *Production Bundle* is *Matte Choker*, a plug-in that gets close to bluescreen perfection by treating the replaced solid colour as a separate layer and expanding or shrinking (choking) the shape of the subject in front. It won't compensate for poor lighting or insufficient forethought, but it does make bluescreening viable for even the smallest production. The rest of the bundle is similarly potent.

BlueICE

NT and Mac
£3000
Bruce Brewer
t *00 32 1652 0202*
w *www.iced.com*

When you're faced with lengthy rendering times, you have several options: hire someone to do your rendering for you, buy a new computer and network the two together, or buy some dedicated equipment that speeds the whole process up. One favourite accelerator is *BlueICE*, built to accelerate many third-party effects in addition to ICE's own. It can accelerate a couple of dozen of the most popular filters, including *Cinelook*, by up to eight hundred per cent. And since ICE recently bought *Final Effects* from Metacreations, you can expect a world-beating ICE'd version of that effects suite to be out soon. Watch out too for the ICE version of *Speed Razor* – very desirable.



***Kai's Power Tools* – a favourite for breathtaking effects bordering on the wild side.**

make music now

"With Macs and PCs now powerful enough to do 'virtually' anything in a traditional recording studio, there are millions of potential musicians out there. *Computer Music* is the magazine that they, and existing hi-tech musicians, have been waiting for..."

- Unbelievable FREE software and copyright-free samples on our coverdisc every month
- Step-by-step interactive tutorials to help you get the most from your music making
- Help section, featuring comprehensive Q&As for beginners and experts alike
- Unrivalled, unbiased reviews of all the latest computer music products

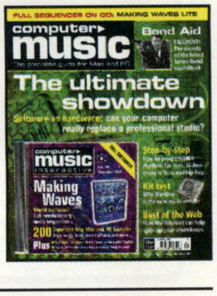
Issue 12 on sale now

computer music
The complete guide for Mac and PC

For a 35% saving on subscriptions or information on back issues call:

01458 271157

www.computermusic.co.uk



FULL SEQUENCER ON CD: MAKING WAVES LITE
computer music
Bond Aid
The ultimate showdown
Software vs hardware: can your computer really replace a professional studio?
computer music interactive
Making Waves
200
Plus
Step-by-step
Kit test
Best of the Web

Rushes' post-production work is not always obvious – for instance on projects for Caprice, the Pet Shop Boys, Travis and Basement Jaxx. Often though, the company's talents stand at the forefront – for example, a recent ad for Hugo Fragrances, which featured multiple clones layered in 30 passes using *inferno.**

Rushes

"Craft is something done by a collaboration," says Production Director Mike Uden. And Rushes' craft is to fuse the 2D and the 3D for the famous…

Rushes is possibly the most famous post-production house in the country. Founded way back in 1977 and acquired by Virgin ten years later, it's worked with the biggest names in advertising, pop music and film, to produce some absolutely stunning effects.

Even if you don't know Rushes, you certainly know the company's work: the classic Ford Puma car ad featuring a transplanted Steve McQueen, and later Dennis Hopper meeting his old self from *Easy Rider* in a Cougar; the animated monkey from *Lost in Space*; and the singing toilets from the recent Nouvelle toilet tissue ad. And even if you missed these, you'll know the promos for the Spice Girls, Michael Jackson, George Michael, Elton John, Madonna and Blur. All have benefited from Rushes' exceptional attention to detail, mastery of technology and enviable creative know-how.

Creating at the edge

Part of Rushes' secret is a willingness to embrace the latest cutting-edge engineering. It was their first company in the world to acquire a *flame**-Onyx combination in 1993, and last year took delivery of the world's first C-Reality system, some innovative film scanning hardware that's really making waves.

But, of course, technology is nothing without artistry, and it's the skill and dedication of Rushes' nigh-on 80 staff that ensures excellent results. As Production Director Mike Uden comments: "Art is something done by one person, craft is something done by a collaboration."

*flame** artists work with 3D modellers, telecine operators liaise with compositors, motion capture specialists mingle with *inferno** experts – each with their own highly specific knowledge, but ultimately working together to produce the kind of fantastic results you see on your TV screen most nights.

Information

Rushes can be contacted on **t** *0171 437 8676, or via* **w** *www.rushes.co.uk*

The future from Rushes…

Production Director Mike Uden reveals the big plan…

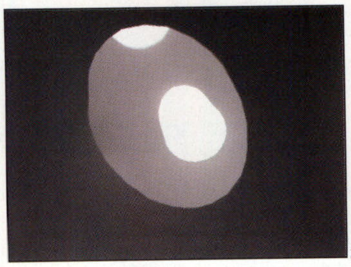
The Rover commercial recently produced at Rushes – apart from being very beautiful – illustrates the current movement towards fusing 2D and 3D imagery.

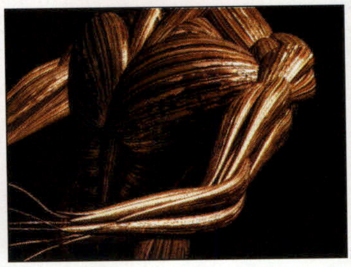
Just to clarify, the area roughly described as 2D covers material which is pre-shot or pre-prepared on film, video and stills. Of course, all these elements would originally have been shot in 3D environments – locations, studios and so on – but once they're committed to a 2D format such as film or video, the spatial information is lost forever, including perspective, angle and distance information.

By comparison, the good 3D artist knows no spatial boundary to his or her work, and doesn't even require pre-shot material. He or she may use pre-prepared material for texturing or referencing, but by and large can work entirely independently from the outside world. In short, 3D software deals in a world contained entirely within the computer – building, lighting and travelling around objects within its own, simulated 3D space.

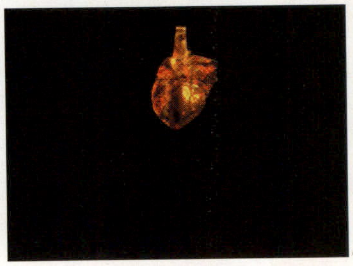
The 2D artist, on the other hand, works in a world of pre-committed perspectives. In the future, however, much of the original live action's spatial information will be re-capturable or re-creatable.

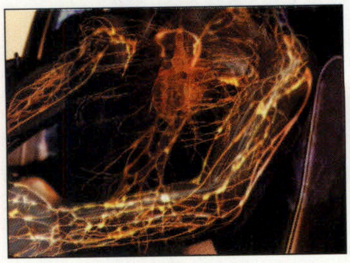
We haven't quite got to this stage yet, but by using the best available 2D software – *inferno**, *flame** and *fire** – in conjunction with the best available 3D software – Alias|Wavefront *Maya* and *Softimage* – we can create some very convincing 3D, live action worlds. While the *inferno** artist can warp, extrude and key existing 2D images, the 3D artist can apply 3D lighting to his or her model work, and – better still – apply 3D tracking to existing 2D objects. Some of the images here demonstrate just how far we can currently do this.


1

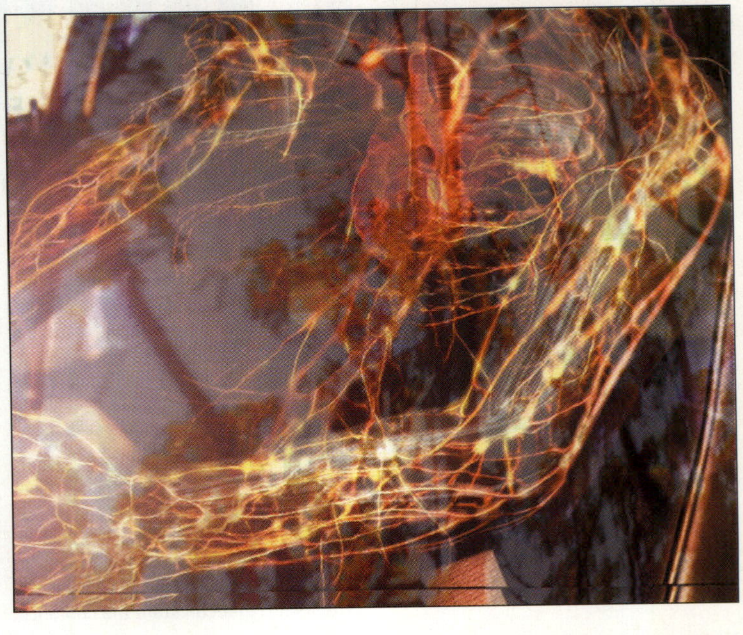

2

3

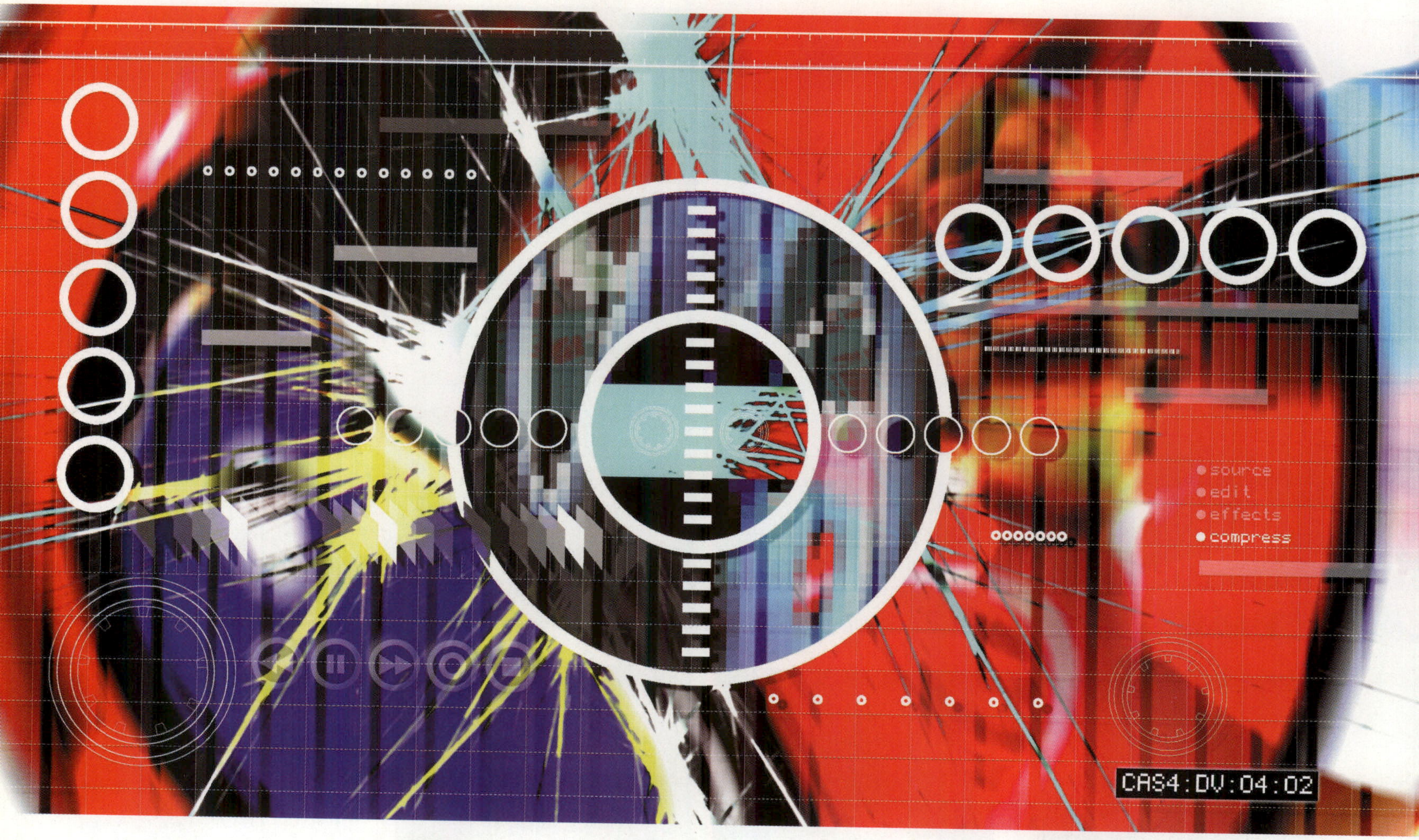

4


5

6


7

The two recent Rover 200 and 400 ads, directed by the ubiquitous Paul Street, emphasise the organic reactions that occur in the body when driving. In one, *Chemistry*, we see how blood pumps around the body. The other, shown here, is *Hormones*. It's a complicated and ambitious piece, featuring live action exteriors shot in South Africa with a dual-camera system, large scale model car interiors and 3D animation. Live-action footage is shot for the background (1), while muscles, veins and a heart are created as 3D models (2, 3 and 4). These are all then composited in *flame, *inferno** and other software (5), which takes a great deal of skill. More live action exteriors are shot (6) and then composited with the last shot to simulate reflections on the car's windscreen (7).**



[COMPRESSION]

Compression

IF YOU WANT TO GET MORE INFORMATION INTO A SMALLER SPACE, WHAT DO YOU DO? MAKE THE INFORMATION SMALLER. THAT'S COMPRESSION, AND IT'S VITAL...

The closer you get to the exactness of the eye, the closer you get to resolution at a molecular level. Film is close, but not that close. Video isn't within sight – but it's getting better. With every year that passes, video resolution climbs a few step towards film quality. But the problem is that we still have to store all those digital video bits and bytes somewhere.

Computer storage is getting faster and more efficient, and one day Iomega will sell a device the size of a credit card that can store the contents of your local Blockbuster... maybe. But in the meantime, compression is our only hope.

Squeeze, squeeze

Put simply, compression makes files smaller. It works by examining a file and replacing large repetitive chunks of data with smaller symbols, which it can substitute back on when it decompresses later on.

So what's the big deal? Well, if your final output video is just 640x480 pixels – barely enough to make a decent VHS copy – then each frame contains 307,200 pixels. A 32-bit colour depth means 32 levels of information for every pixel, or 9,830,400 bits per frame. European TV plays at 25 frames per second, so you're looking at a little over 244 megabits per second of video.

In which case, how do you save a half-hour video clip on your computer without investing in a 55GB hard disk? Simple – you don't save all the bits...

The simplest form of compression is known as 'run length encoding'. It works like this: if you compress the sentence "Artists read Computer Arts to make their computers artistic" by replacing the words 'computer' and 'art' with the symbols * and #, you end up with "#ists read * #s to make their *s #istic". You've reduced a 59-letter sentence to 39 letters. And a decompressor simply does the reverse, all in real time.

MPEG to the rescue

But still, we've only reduced our half-hour video clip to 33GB. Enter MPEG. This clever form of compression stores the first frame, followed by only the *changes* to each subsequent frame. For instance, if the shot is of a frog crossing the road, then the road is not changing. All the compressor has to do is save the information for the frog and the piece of road the frog occupied previously. The amount of information for each subsequent frame is very small, and suddenly the file size has plummeted drastically.

To make sure the decompressor at the other end doesn't have to work too hard, MPEG saves the whole frame data every thirteen frames or so. Even adding two whole frames every second can reduce the MPEG file size by factors of up to twenty. Your VHS output has now become as little as 3GB. Much more manageable.

The set-back

There is, of course, a side-effect: loss of quality. The first thing to disappear in compression is detail, so it's important to learn how to light your subjects. In particular, too much darkness is lost quickly, even on the most professional video cameras.

So the test is to find a compression system that works for you. This will depend largely on your budget and what you intend to use the video for. The best quality output is MPEG, and many suitable compressor cards are available for it – but at a cost that rises steeply with the speed of compression and features you need.

At the compression stage you should always start with *QuickTime*. This, and Microsoft's AVI, are 'holders' that use other compression-decompression techniques (codecs) to do the work of reducing a file to a manageable size. *QuickTime* remains the choice of many professionals.

Which codec?

The codec you choose is also governed by your final audience. If you intend to edit the file and simply run it out to a video recorder, use the DV codec that comes with your video card.

Functionally, DV falls between MPEG and Motion-JPEG (effectively a series of JPEG-compressed frames), selectively deciding how to compress the image depending on the complexity of the subject.

If you want to create a video file that other people can play on their computers, it's vital that you know your audience. There's no point creating a super-fast broadcast-quality movie (that requires data rates from around 15MB per second) if your target audience owns bog-standard PCs with four-speed CD drives, which average a data rate of 600KB per second.

Failing to get this right means your audience sees a jumpy image with long flashes between frames, as their hardware tries to keep up with the torrent of data that your film is funnelling at it. As a video producer you are going to have to start doing some sums; fortunately, they're not too hard.

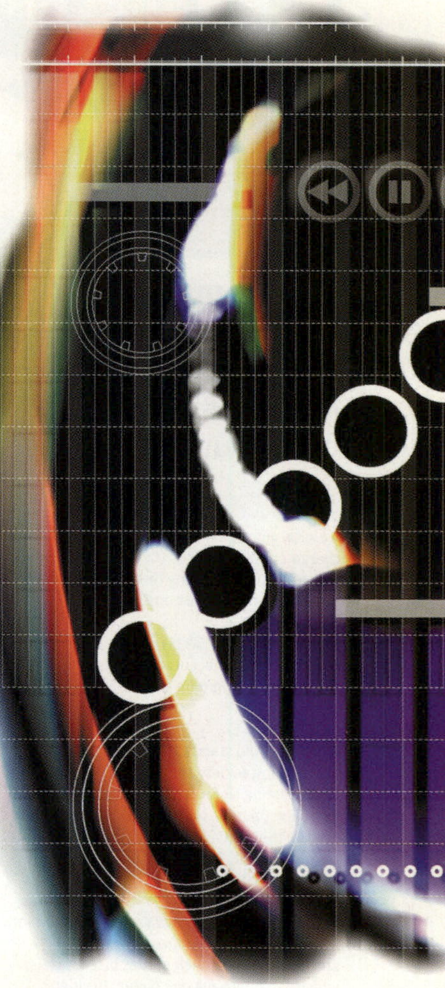
Sorenson and co

By far the best all-round codec is Sorenson, and it arrives as standard in all editing software courtesy of Apple's *QuickTime* (the latest versions, at least). DV compression needs your audience to have a DV decompressor in their computer, so it's unsuitable for widespread viewing. Sorenson, sitting as it does inside *QuickTime,* simply requires a *QuickTime* player. For a while, Cinepak and Indeo were the best ways of compressing 24-bit video for fast playback on computers. But loss of detail has driven the market to the more advanced and smaller file sizes of Sorenson.

If you intend your final output to be across the web, you should look at RealNetworks and its live streaming. The latest incarnation of *QuickTime* includes fully real-time streaming, instead of the previous 'Faststart' pseudo-streaming. But the quality and reliability have yet to be proven better than the industry-standard – *RealProducer* and *RealPlayer,* both of which are available as free downloads.

There are plenty of other MPEG formats on the horizon. MPEG-2 (today's best) is the format for DVD movies and digital television, and has attracted the likes of Sony – even for fast-paced newsgathering operations. MPEG formats for the future currently run up to MPEG-7, and include features such as handling multimedia and database objects within the video stream.

MPEG may align the way we distribute all computer video, but not yet. The best compressor you can use is the DV codec, but only if you don't intend to distribute the digital file. If you do, use some form of MPEG. And remember, compression is a necessary evil; use it sparingly, use it well, and it should have a minimal effect on your masterpiece.



> ***"How do you save a half-hour video clip on your computer without investing in a 55GB hard disk? Simple – you don't save all the bits..."***

Squeezing the most out of compression

Get your footage right, and it won't die in the compression. Here are six top tips...

- Avoid hand-held camera work, and use a tripod wherever possible. This is perhaps the single most important rule of compressed camera work. Plan for limited motion. The less the picture moves, the less work the compressor has to do, no matter what type it is.
- Dress your frame in bright colours. Solid light reds, blues and yellows are best, while darker colours and patterns generate phasing effects on the image, which are interpreted by the compressor as frame changes.
- Consider soft-focus, plain backgrounds instead of sharp bookcases and blinds with lots of detail.
- Use a large, clear typeface for the titles. Video doesn't handle complicated fonts well. (Besides, they're far easier to read.)
- Avoid auto settings on the camera. Auto-focus and auto-exposure change the frame contents haphazardly, and it's better to learn how to light a scene, rather than rely on the camera's whims.
- Avoid compression as much as your disk space and output format enables you to. Easier said than done...

The Sorenson video compressor is part of the latest *QuickTime,* and generally produces damn fine results.

computer arts special
The definitive guide to digital video • Mac & PC
cas04

glossary

126 items of DV-related jargon busted wide open on your behalf

If you're getting into digital video you'll need to know your artefacts from your aliasing, your composite from your compositing and your interlacing from your interpolation. That's what we're here for...

3CCD

A digital video camcorder which uses three charge-coupled devices (CCDs), the parts which sense light. Using three CCDs ensures better results than just one.

A-D Conversion

Analogue-to-digital conversion, as performed by a digitiser. Compare quantising.

AES/EBU

A digital audio standard from the Audio Engineering society and European Broadcasting Union, citing 32, 44.1 and 48KHz sampling up to 24 bits. DAT, for instance, offers 48KHz, 16-bit sampling, and CDs compare at 44.1Khz, 16-bit.

Aliasing

Disturbance cause by low sampling resolution. For instance, small fonts on screen look stepped, because their curves bisect pixels, which can only have one colour. In video, temporal aliasing occurs when movement conflicts with frame rate, say when car wheels appear to be going backwards. The same for the naked eye – your visual system has a sample rate too. Aliasing is a type of artefact. The solution, in software technology at least, is anti-aliasing.

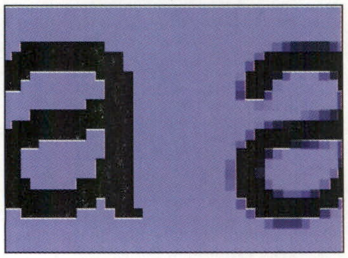
Alpha Channel

Corresponds to the key channel of the analogue world, used for keying, or combining footage. Compare chroma keying.

Analogue

A format that, in audio and video, records the intensity of the signal on tape directly as a value. It's continuous, as opposed to the binary ones and noughts of digital. VHS, Beta, Hi 8 and 8mm are all analogue formats.

Quality, in the form of generation loss, and expense are key issues in analogue. DV, Digital8 and MiniDV, on the other hand, are digital video formats.



Jagged aliased text (left) can be fixed, or anti-aliased, with interpolation (right).

Anti-aliasing

Smoothing the effects of aliasing. In graphics, say when a small font looks stepped on-screen, this is done by interpolation: giving pixels falling across the edges of the font an intermediate colour between the font and background colours. Motion blur can help in the case of temporal aliasing.

Artefact

An image disturbance caused by technological limitations. Mosquito noise, or feathering, quilting and motion blocking are three types. Aliasing could also fall under this category. Compare banding.

Assembly editing

Sometimes used to mean linear editing.

Aspect ratio

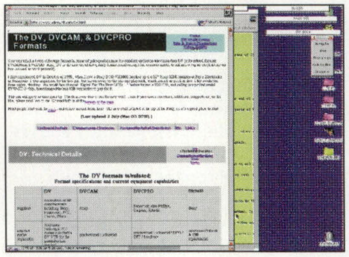
Ratio between the length and width of your video image. PAL, NTSC and Secam all use 4:3. PALplus and HDTV are using 16:9, a cinema-style letterbox format.

AVI

Audio Video Interleave – a digital video format from Microsoft. Requires software only.

Background rendering

Some systems can conveniently carry out the laborious rendering process in the background, while you get on with something else. An excellent idea if you happen to be short of a spare computer.



The DV, DVCAM, & DVCPRO Formats

DV: Technical Details

The DV formats tabulated:
Format specifications and current equipment capabilities

DV	DVCAM	DVCPRO

Some excellent DV sites are on the Web, including _w_ www.adamwilt.com/DV.html

Batch digitising

If you're using a large amount of material, it's a good idea to digitise the footage at a high compression ratio and work with this low-quality output to save space. Then, when you've worked out which bits you want in your final edit, you can batch digitise them from the original footage at a much higher quality – because there's less of it, you can expend more disk space on quality.

Banding

If you see 10 (NTSC) or 12 (PAL) stripes on your video, it's because one of the two heads on your equipment's scanner isn't working. It may be clogged (clean it) or it may be dead.

Betacam

A half-inch analogue video format which has been developed to Betacam SP. It offers better quality than S-VHS, say.

Betacam SX

A digital recording system from Sony using 10:1 MPEG-2 compression. Sony intends this to replace Betacam SP.

B-frame

Bi-directional frame. See MPEG.

Bluebox

A form of chroma keying which uses blue as the key. You can record a scene over a blue background, then replace the blue areas with footage from another source. Compare with alpha channel.

Broadcast quality

Unlike other standards, there's no hard and fast agreement on this what constitutes broadcast quality, but Betacam SP makes for a reasonable reference point. In digital, you could cite a compression ratio of 1:2.

Capture

The name given to the activity of digitising video footage from an outside source onto your computer's hard drive. Compare A-D conversion and quantisizing.

Chroma keying

Superimposing video using a key colour, often green or blue. See Bluebox.

Chrominance

This is the colour part of a video signal, giving hue and saturation information. Compare luminance.

Clipping

Audio distortion caused when the system is overloaded, a notable problem in digital, and especially in A-D conversion.

Codec

An algorithm (mathematical method) for translating to and from a compression format. The term 'Codec' is an abbreviation of COmpressor/DECompressor.

Colour difference signal

A video signal needs to contain chrominance and luminance information. The chrominance part is often sampled in the form of two chrominance difference signals. See component signal.

Colour saturation

Intensity of colour.

Component signal

One luminance and two chrominance signals are often used to supply the information needed to display video images. These are the three component signals.

Composite

Two meanings. One is for a composite system, which combines both the luminance and chrominance signals used to display video (see component signal). The other is the result of compositing footage together (see below).

Compositing

Layering different focal planes together for a stretch of footage, for special effects. Not a quick job. Chroma keying is often involved.

Compression

Any system of squashing data – footage, graphics, effects, sounds and what-have-you – for smaller file sizes and faster transfer. Conversely, you'd usually see a loss in quality, causing artefacts. See codec.

Compression rate
The change in file size achieved by compression. This is expressed as a ratio, so 5:1 compression (which is used by all DV variant formats) reduces a file to 20% or a fifth of its original size. The higher the ratio, the greater the loss in quality.

Control interfaces
Interfaces for controlling your external hardware via your software. The interface type is important. Compare Control-L (formerly LANC) and FireWire. RS-232 and RS-422 sit at the serious pro end of the market.

Control-L
An editing protocol enabling two-way communication between your recorder and computer. Used by Sony 8mm cameras and the like. It was formerly known as LANC, in a slightly different form. FireWire fulfils the same function and more, and is rapidly becoming the new DV standard.

Conversion of Standards
Converting TV signals between standards, say PAL, NTSC and Secam.

Cross colour
Flickering or shimmering of some colours in video images, like on checked shirts. This is because fine structures like this, representing high-bandwidth frequencies, vary in amplitude and phase between lines.

Cut
A transition from one scene to another.

D1 – D9
Digital video tape format. D1 offers extraordinary quality, Sony-Ampex's D2 is all but defunct, D3 is a Panasonic rival to D2, Sony's D5 works without data reduction (good in post prod), D6 is from BTS, D7 is the same as DVCPro, and D9 is JVC's Digital S.

D-A conversion
Digital to analogue conversion, or A-D conversion in reverse. For instance, if you output your final digital edit to Betacam SP.

DAT
Digital Audio Tape, offering digital sound at 48KHz, 16 or 20-bit.

Data rate
Just what it says. A higher data rate in digital video means less compression and better quality, but demands a faster hard drive.

Digital8
A consumer digital video format from Sony, said to be inferior to MiniDV. It is, effectively, DV-format video and audio on 8mm Hi 8 tape rather than DV tape.

Digital Betacam
A 10-bit digital VCR format using 2:1 compression, from Sony.

Digital S
Another name for JVC's digital D9 format.

Digital video
Video recorded as ones and noughts. Avoids generation loss through repeated copying that is an issue with analogue, but the high volumes of data involved demand compression. DV, MiniDV and Digital8 are all digital formats.

Digitiser
A video capture board with analogue inputs and the facility to convert analogue signals to digital data.

Dissolve
A soft cut between video sequences, where the level of one is gradually reduced as the other is increased.

DLT
Digital linear tape, for storing digital image and audio data. Quick access, but pricey.

Drop Frame timecode
A form of SMPTE timecode designed to match NTSC. It exists because NTSC actually runs at 59.94KHz, and not 60KHz, which corresponds to 29.97 fields per second, rather than 30.

DST
Digital storage technology – a useful backup medium for high-end post production.

DTV
Digital TV or Desktop Video. Digital TV is an alternative standard to PAL and NTSC, and it can be either interlaced or use progressive scanning. DVB is the European equivalent.

DV
Used as an abbreviation of generic digital video. It's also a specific, profession-grade format for digital video, using large tapes. Compare the DV variants MiniDV, DVCAM, Digital8 and DVCPro. All use the same compression, 5:1, and all are acquisition formats, rather than distribution formats (that is, you use them to take pictures, and then generally copy to another format for distribution). DV is not to be confused with DVD, a distribution format.

DVB
Digital video broadcasting, the European corollary to DTV in the US.

DVCAM
A Sony DV format which locks the audio tracks to the video.

DVCPRO (PRO50)
A format from Panasonic identical to DV and MiniDV, but which is said to work better with linear editing equipment.

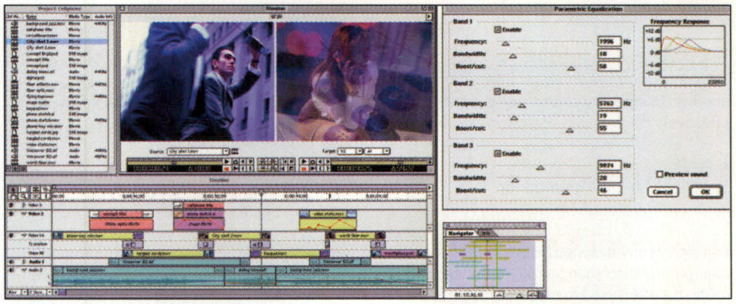
DVD
Digital Versatile Disc. A digital distribution medium, which uses MPEG-2 compression, similar to JPEG. The compression format is too complex and time-consuming for DVD to be a realistic, real-time acquisition format like DV.

DVE
Digital video effects, or a device which generates them.

DVTR
Digital video tape recorder.

Edit Decision List (EDL)
List of edit points, transitions and so on, for the final edit. It comes from linear editing, where meticulous planning is needed to produce the final edit in one fell swoop, direct from the original footage, to keep generation loss down.

Equalizer (EQ)
Use one to isolate and adjust the loudness of specific frequencies in audio.



The digital video editor, *Premiere*. The timeline across the top is your key workspace, for laying out sound and video tracks, and applying transitions and effects.

Fade to black
Exactly what you think: reducing the video amplitude to a uniform black image.

Feathering
See mosquito noise.

Field
Video images displayed by interlacing, in PAL format for instance, are made up of two fields of alternating lines. Hence frame grabs don't look too good, unless you de-interlace them (use any decent image-editing package, such as *Photoshop*). Progressive scanning systems don't use fields, but build pictures line by line, as on your computer.

FireWire
A high-speed bus, capable of maintaining over 12.5MB per second transmission. It also enables your software to control your DV device (compare Control-L). Otherwise known as IEEE1394, FireWire seems to be the answer to digital video's prayers and comes as standard on a G3 Mac. *Computer Arts Specials*' recommendation is that you shouldn't buy a camera without a Firewire port, or you'll miss out on half the fun. Compare i.LINK.

Frame
You really need to know this! One still image of the, say, 25 per second (in PAL) that make up video. Compare field.

Frame rate
Frequency of frames in time, renewing the displayed image, measured in Hertz. 50Hz, or 25 two-field frames per second, is the minimum for flicker-free video (and the standard for PAL – NTSC uses 60Hz). Computer monitors generally start at 75Hz.

FX
Pointless slang for 'effects'.

Generation loss
Every time you make an analogue copy, there is some loss of information, resulting in artefacts. Hence copies-of-copies-of-copies can look bad. Digital video is an effort to overcome this, but generation loss can still occur through repeated compression and decompression.

HDCAM
A digital video format from Sony, based on Betacam. It was designed for HDTV, and supports a resolution of 1920x1080 pixels in 16:9 letterbox aspect ratio. The internal compression rate is 4:1.

HDTV
High Definition TV, meaning any TV signal standard that offers increased resolution over traditional NTSC and PAL. There's no standard other than that it uses a 16:9 letterbox format. Compare PALplus.

Hi8
An 8mm, analogue, consumer tape format from Sony, based on Video8. Compare Digital8.

Horizontal resolution
Vertical resolution on TV is fixed by the standard (PAL 625 lines, NTSC 525 lines). Horizontal resolution, however, depends on devices and formats. VHS can achieve a maximum of 250 lines.

Hybrid system
A system capable of controlling both linear and non-linear equipment.

IEEE 1394
See Firewire.

i.LINK
A slightly modified FireWire technology for DV.

Illegal colours
Colours which are outside the restricted gamut displayable by video, but which your computer may nevertheless be able to generate.

Interlace
In interlace standards like PAL, each frame is divided into two fields with alternating lines. PAL runs at 25 frames per second, so 50 fields are transmitted per second. This appears as a continuous event.

Interpolation
Calculates intermediate values between pixels for video effects and anti-aliasing.

Key
A key signal works as a mask. See keying, chroma keying and bluebox.

Keycode
In film, Keycode matches digital's timecode, numbering frames so machines can read them.

Keyframe
In video, keyframes are frames at either end of an effect sequence; in animation, they sit at either end of an animation sequence. It both cases, it's a means to let your computer know where to start and stop applying a function – say, a motion blur. You can also use keyframes within the sequence to define changing point of the function – say, if you want your blur to

increase, then decrease.

Keying
Superimposing one video sequence over another. Using a key colour, say, you can effectively cut out parts of the images.

LANC
See Control-L, LANC's successor.

Linear editing
Editing by copying video from one tape source to another, rather than taking the software route. It's often used to mean analogue editing, because in digital video it's both unnecessary and difficult (tight frame packing on-tape makes timing tough). It's called linear, because you more or less have to edit continuously in the direction of the video. It's also known as assembly editing. Compare non-linear editing, which is exclusively digital.

Luminance signal
The part of the video signal that send brightness information, the other parts being Chrominance signals.

MHz
MegaHertz – the more your computer's processor boasts, the better.

MiniDV
'Prosumer' or semi-pro digital video format, used by the excellent new batch of cameras including the Canon XL1 and Sony VX-1000. Compare DV, Digital8 and DVCPro. It has smaller tapes than the professional DV format, but is otherwise identical.

M-JPEG
Motion JPEG. JPEG stands for Joint Photographic Experts group – a video compression format based on the widely used JPEG compression for images. It compresses each frame separately, to create a sequence of JPEGs. Compare MPEG.

Mosquito noise
A type of artefact, also called feathering, typically around fine diagonals and small text. Compression is the cause.

Motion blocking
If two fields in a frame are significantly different, the compression codec can't compress them together. So they are compressed separately, with some loss of detail and a block-ish look. So it's an artefact, and it's most obvious around objects moving against a static background.

MPEG
Currently the world's favourite compression format, it's all over the Internet. MPEG (Moving Picture Experts Group) offers massive video and audio compression with comparatively low loss in quality. It's different from M-JPEG in that the codecs can analyse information from a sequence of images together, for interframe compression. There are (in theory) four standards, MPEG-1 to MPEG-4. MPEG-1 works with low datarates and is useful for multimedia. MPEG-2 was designed for coding interlaced images at transmission rates above 4 million bits per second, and is currently used for digital TV broadcast and DVD. A proposed MPEG-3 standard, intended for High Definition TV (HDTV), was merged with the MPEG-2 standard and is not used; MPEG-4 is well on its way!

Native digital editing
Native systems retain as much of your original footage in the editing as possible, to avoid digital generation loss (compare sequencing). This is by retaining the original format as far as possible, and avoiding compression and decompression routines.

NLE
See non-linear editing.

Noise
Slight irregular variations in all analogue signals. In video, this adds slight noise to the image you see. Pure digital has no noise.

Non-linear editing (NLE)
You need a computer, a capture card and the right software (see Buyer's guide, page 32). In principal, you capture the bits of video you want onto your hard drive, after which you can do just about anything you want, then render the result back out.

So non-linear editing has to be digital (computers don't do analogue) and it's often used just to mean digital video. It's called non-linear because you're not constrained to starting at the beginning and finishing at the end, as you generally are with linear editing. A popular metaphor says it's like using a word processor instead of a typewriter.

NTSC
National Television Standards Committee. It's the USA standard for colour broadcasting, at 60Hz. The spec is 525 lines, 60 fields and 30 frames per second. It's also used in Japan, Canada and elsewhere. Compare this standard to PAL and Secam.

On-line editing
Cutting your final edit from the originals in one go – the basis of linear editing.

PAL
Phase Alternating Line – the European TV standard. The frequency is 50Hz, which corresponds to 25 frames or 50 fields. Compare with NTSC and Secam. PAL offers superior colour stability and higher vertical resolution than NTSC.

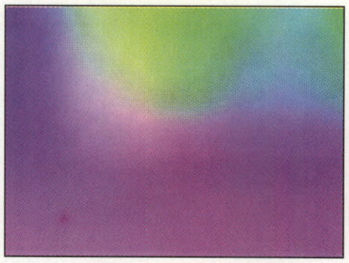
PALplus
PAL-compatible TV standard that differs in offering 16:9 letterbox format and pre-filtering of the signal for a better image. Compare HDTV.

PCI bus mastering
PC technology that makes quality mid-range capture cards a reality, with over 3MB per second and perfectly synced audio.

Progressive scanning
An alternative to interlaced scanning (as per PAL) that builds the video image line-by-line rather than from two fields of alternating lines.

Quantising
Sampling the analogue signal in A-D conversion. 8- and 10-bit sampling is standard for video production, while pro audio uses 12- or 16-bit sampling.

QuickTime
Apple's video and animation system used for capture and playback, supporting many codecs including Cinepak, JPEG and MPEG. It's built into the Mac OS, though players are also available for PCs; because of it's versatility QuickTime has established itself as the dominant standard for many applications.



Here's a still in MPEG format with zero compression – looks good up close.

Quilting
A minor – yet irritating – spatial artefact that appears around diagonals.

RAID
Using more than one hard drive for a higher data rate and/or security.

RCTC
Rewritable consumer Timecode, a timecode format from Sony for Video8 and Hi8, which you can record over at a later date.

Rendering
Called 'the curse of non-linear editing'. When you hit Render, your software and hardware translate your video clips, cuts, transitions, effects and so on into a final, continuous video file. It may take some time.

Resolution
More resolution means more detail, in images, in sounds, in monitors and in much besides.

RGB
Red, green and blue. Used as a format for defining colour (HSL and Hex are others). RGB is used in video cameras and computer monitors. In video editing, however, luminance and colour difference signals are usually used.

Rotoscoping
Using live footage as a basis for animations.

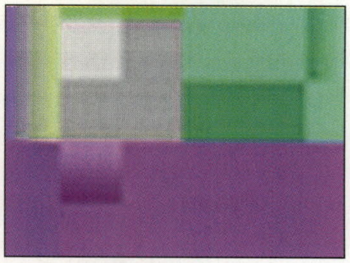
RS-232 and RS-422
Pro control interfaces.

Saturation
See colour saturation. It's also used to mean over-saturation, a problem where the brightest parts of your video 'bloom' to create an unwanted effect. The solution is to reduce exposure, and some cameras offer zebra striping to warn you of saturation (which can be hard to spot in your viewfinder).

SDI
Serial Digital Interface, developed mostly by Sony. SDTI, Serial Digital Transport Interface, extends on its functionality.

Secam
Sequential Couleur Memoire. The French colour broadcasting standard, it's on the way out as PAL and NTSC take over.

Sequencing
The term for compressing, decompressing and converting digital video repeatedly. It can cause digital generation loss due to continual rounding up in the algorithm calculations, causing digital artefacts.



The same with 50% compression – the tell-tale sign is blockiness like this.

SMPTE
Society of Motion Picture and Television Engineers. The most widely-used standard for timecode, which tracks time in hours: minutes: seconds: frames.

Subpixel
A unit smaller than a pixel. Even though DV's smallest unit is the pixel, you can get better results (crisper pictures) from a system which works in smaller units.

S-VHS
Analogue format based on VHS that spans to consumer-semi-pro divide.

Synchronisation
Linking image and audio so they run in time.

TBC
Time base corrector. It balances out time faults in video, caused by flutter, say.

Timecode
Timing information added to video tape for accurate editing. It's expressed in hours, minutes, seconds and frames (for instance 1:20:32:5), and is particularly convenient for using your software to control your recorder.

Timeline
Graphical software interface used for non-linear editing, with time across the top and tracks down the side. Just drag and drop clips where you want them.

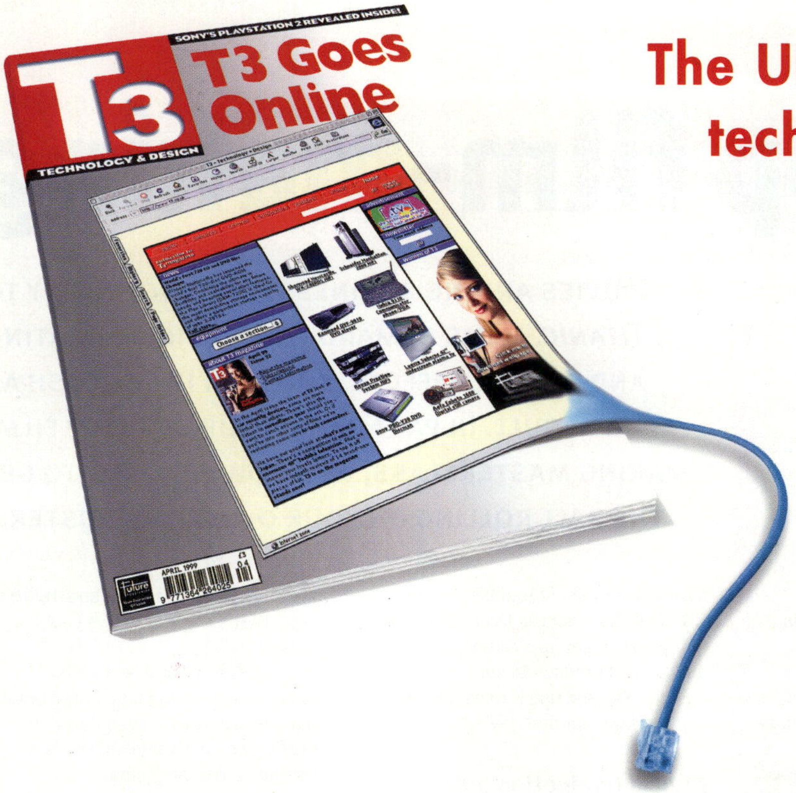
Transition
A change from one video sequence to another, over a cut. In its simplest form, a dissolve.

Trimming
Precisely fitting the length of a clip at a cut. Not so hard on non-linear systems, but for linear systems you need a trimmer to do the job.

VHS
Video Home System. While we're waiting for DVD to truly kick in, this is still the dominant home format, but it's old, low-res and unreliable.

VITC
Vertical interval timecode – one popular way to record timecode.

Zebra Stripes
Higher-end cameras, like the Canon XL1 and Sony VX-1000, have a facility for warning you of over-saturation, by 'zebra-striping' saturated areas of your image. You can then decrease the exposure accordingly.



The UK's best
technology magazine...

...now online

www.t3.co.uk

3D Studio MAX RELEASE 3 *** SPECIAL OFFER ***

MONEY BACK OFFER

Question: Thinking of upgrading?
What are the new features?
Is it worth upgrading?
What about training?

+

MAX R3 UPGRADE OFFER

Upgrade to 3D Studio MAX Release 3 and receive a ***FREE***
3D Studio MAX Release 3 Fast***TRAK*** Interactive Training

3D Studio MAX R1.x to R3 @ £995
3D Studio MAX R2.x to R3 @ £595

***Answer**:* Buy our 3D Studio MAX Release 3 FastTRAK Interactive Training CD-ROM at only £59, on 2 CD's we cover the new features in 126 AVI's (4 Hours, 58 Minutes).

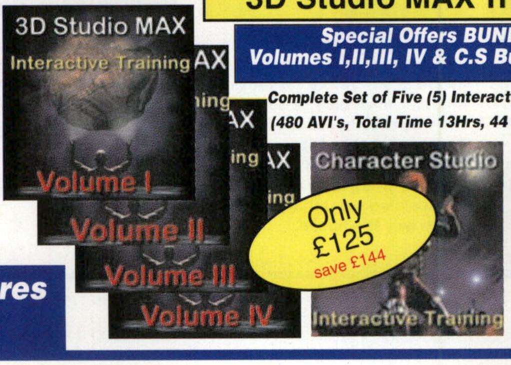
MONEY BACK: When you see how good MAX Release 3 is, and want to upgrade, we will give your money back on our 3D Studio MAX Release 3 FastTRAK Interactive Training CD-ROM against ***every*** MAX Release 3 upgrade purchased from us.

Learn MAX Release 3 Features
******* ONLY £59 *******

3D Studio MAX Training

Special Offers BUNDLE :-
Volumes I,II,III, IV & C.S Bundle @ £125

Complete Set of Five (5) Interactive Training CD's
(480 AVI's, Total Time 13Hrs, 44 Min)



DigitalX Computer Graphics Web Site
File Edit View Go Favorites Help
Back Stop Refresh Home
Address http://www.digitalx.co.uk/
DIGITALX
Computer Graphics Web Site
Home
Online Store
News & Links
Company
Contacts
Services
Visualisation
Graphics & Video Solutions
Workstations
3D Animation
MAX, Photoshop, Effects Plugin's
MPEG & Video Output
14" - 40" Monitors
3D Digitisers, Digital Cameras, Graphics Tablets, Monitors, Motion Capture, OpenGL Graphics Cards, Projectors, Printers, Render Solutions, Scanners.
Done
Internet zone
Start

Over 1,000 Professional 2D & 3D CAD, Graphics, Animation, Video & New Media Products Online Now!

Visit our OnLine Store
@ http://www.digitalx.co.uk
Visit our OnLine Store
@ http://www.digitalx.co.uk
Visit our OnLine Store

"What our customers say about our Interactive Training CD's"

"Absolutely fantastic, the CD's have made sense of a very complex package. Keep up the good work" *Alex Shaw, Alex Shaw Art & Design.*

"Well done, absolutely brilliant, it's made MAX so quick to learn"
Andrew Gribbon, Multimedia Student.

For a full listing of course functions, content, sample download, or to order a FREE demo CD:
Visit http://www.digitalx.co.uk

DIGITALX

778/779 Buckingham Avenue, Slough Trading Estate, Slough, Berks, SL1 4NL.
Tel: 44-(0) 1753 550336 , Fax: 44-(0) 1753 550350

All prices exclude VAT, price subject to change without notice.

Desktop film-making

MOVIES ARE BIG BUSINESS: FROM *TOY STORY* TO *TITANIC*, FILMS DEMAND PROFESSIONAL EDITING AND SPECIAL EFFECTS, AND COIN IN THE CASH AS A RESULT. IN PART ONE OF OUR DESKTOP FILM-MAKING MASTERCLASS, WE SHOW YOU HOW TO GET THE BALL ROLLING ON YOUR OWN BLOCKBUSTER...

Of the many American landmarks, Hollywood is surely one of the most glamorous. And it's here that many of the world's most-seen and highest-grossing movies are made. America has the monopoly on film-making and the cash to do it. However, there has been a resurgence in British film-making over the past few years: *Sliding Doors* and *Lock, Stock and Two Smoking Barrels* are two recent successes. And here's your chance to get a slice of the action...

From here up until page 75, we're going to show you how to go about making a short film. We're going to be doing the whole of the post-production work on a desktop PC, including editing, special effects, and titling. When the movie's finished, we're going to look at different ways of rendering it to produce the best results on video, CD-ROM, and over the Internet. In the first part, we set up a Super-VHS quality post-production suite on a desktop PC, and use it to digitise the footage from our first day's filming.

Digital production suite

Most modern computers have the power for limited desktop video. However, our project requires a little more. We have to put together a system which can import high quality video and sound, edit it in some quite advanced ways, produce smooth graphics and animations and, finally, output the finished movie onto videotape or CD-ROM.

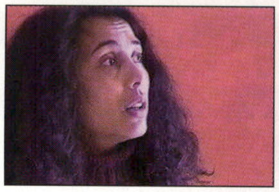
A fast processor and plenty of memory is the first requisite: we're using a Pentium Pro with Overdrive to bring the PC up to speed, and 48MB of RAM. That's adequate – we could probably have used a 166MHz machine. However, it really isn't possible to have too much RAM or too fast a processor for desktop video. Anything you can do to cut rendering time has got to be a plus.

Processing speed may be important, but hard disk space is the real killer. We are using 6GB, and it's not enough. Here are some rough calculations: a 15-minute film means shooting about two hours of footage. Let's say we digitise one hour of that at 1000k per second (p/s) – that's about S-VHS quality. So, we need 3600MB for the footage.

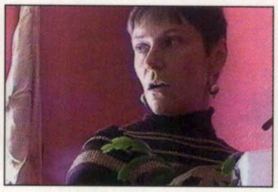
You also need to be able to fit the finished film on your machine (another 1GB), and any other programs your computer needs to run. This is why

Common shots

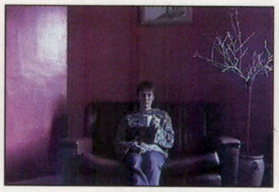
These are a few standard shots used time and again in documentary and drama production. They're not intended as a prescriptive set of rules, but it's useful to understand the language of film and TV before you start putting together your own production. Of course, the shots you choose and the way you put them together has to depend on what best tells the story. Your own style as a videomaker depends as much on how you break the rules as how you stick to them...



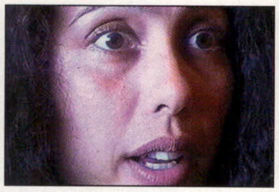
Close Up: in this shot, the actress is looking to the right of the screen, so we've left her some space in the frame to look into. Generally, the more to one side the actor is looking, the more space you should leave for them to look into.



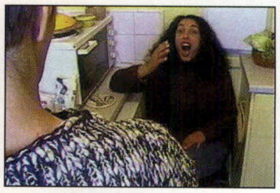
MCU (Medium Close Up): the classic 'head and shoulders' shot. Normally, you'd line this up so that the top of the head had a little space above it, and the eyes were a third of the way from the top of the screen. However, we framed this a little lower because it felt more balanced with the top of the plant pot in shot.



Long Shot: an establishing shot, used to make the viewer aware of where the characters are, and what they're doing. The way the shot is lined up can do a lot to set the scene. Here, for example, the actress appears alone and isolated, but there's also something comic in the way it's posed.

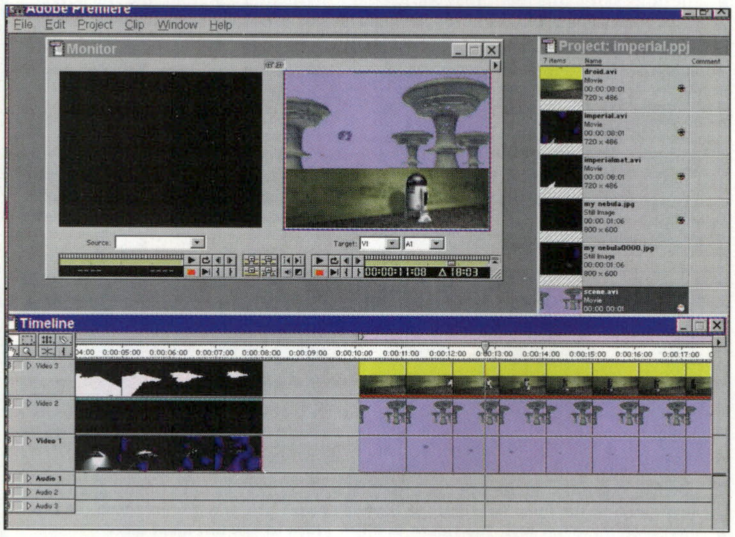


ECU (Extreme Close Up): the face, or part of it, fills the entire screen. When mixed in with wider shots, you can use this shot to create a more intense atmosphere.



Over The Shoulder Shot: this is a good way to indicate the relationship between two people in a scene. Here, both characters are brought into the frame, and the viewer gets a sense of the way they're interacting with each other.

masterclass: part one


Adobe Premiere
File Edit Project Clip Window Help
Monitor
Source:
Target: V1 A1
00:00:11:08 Δ 18:03
Project: imperial.ppj
7 items Name Comment
droid.avi Movie 00:00:08:01 720 × 486
imperial.avi Movie 00:00:08:01 720 × 486
imperialmat.avi Movie 00:00:08:01 720 × 486
my nebula.jpg Still Image 00:00:01:06 800 × 600
my nebula0000.jpg Still Image 00:00:01:06 800 × 600
scene.avi Movie 00:00:00:01
Timeline
0:00:14:00 0:00:15:00 0:00:16:00 0:00:17:00
Video 3
Video 2
Video 1
Audio 1
Audio 2
Audio 3

A screenshot from *Premiere* – one of the most flexible video editing packages on the market. Here, we're editing some *Star Wars*-style graphics for a different project.

your suite will need a back-up medium; we used recordable CD-ROM (a Yamaha 4260), because it's cheaper per MB of storage than anything else, and it enables you to take video from one PC to another quickly and easily.

If you don't have the space, you can always compromise on digitising quality, or simply edit the movie in short scenes – only digitising what you need for the scene you're working on, then deleting it when you've fine-tuned that section of the film.

Video capture

The final requirement for digital video is, of course, the video capture card. This is the interface between the video and the PC. It handles digitising the raw footage onto your hard disk, playing it back while you're editing it, and sending out the finished work onto video (if that's where it's destined for). The main players in the video capture market are Fast and Pinnacle. Each offers a capture card at around £1000, with the ability to digitise at S-VHS quality and above. In reality, the results you get from your capture card are a combination of the card's quality, and the speed at which your hard drive can store the incoming video.

As for software, this will depend on your aims. Capture cards generally come with pretty good editing software bundled (*Premiere 5* being the favourite), and on page 62 we look more closely at what can be achieved with the different packages available.

If you're putting together your computer from scratch, it could be worthwhile talking to one of the companies who specialise in digital video systems (Digital Video Computing). Buying a complete system will at least mean that you can get the right advice about what you need; and if you run into problems, you'll have someone to talk to about it…

> *"Depending on your style and the size of your production, storyboarding can involve full colour paintings of every shot in the film, or a few notes scribbled in the margin of the script"*

Planning the shoot

With our computer set up, we can begin making our movie. This is the tricky bit. You can't just turn up on the first shooting day with a vague idea you're going to make a film, and expect great results. However, you can't turn up on the first day and expect to stick to your meticulously laid-out storyboard either. Making a good film has less to do with the clever ideas you come up with when you plan the shoot, than how creatively you react when all your plans go out of the window.

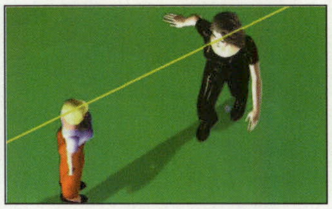
Every production starts with a script. Writing a good script is a discipline in itself (and well beyond the scope of this series), but there are practical considerations which we've tried to think about for this production. We've gone for a simple story, using only a few characters and locations. This reduces the budget, and cuts out some of the more difficult shooting problems. We've also taken into account the fact that a short film (10 to 15 minutes) requires a very efficient story-telling style.

But a good script is not enough: ⇨

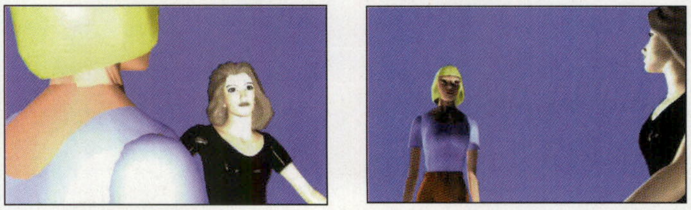
A close-up detail shot, often used to break up the action, to indicate an important event, or to cover a cut where a line or gesture is removed from an otherwise continuous shot.

Get an angle

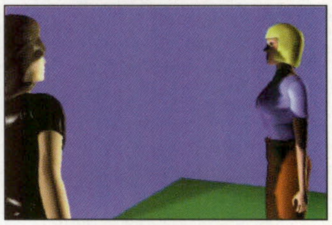
When shooting a scene from several different angles, make sure that actors appear to be facing in the same direction in each shot. If you shoot a close-up of a character facing left to right on the monitor, then move to a wider shot from the other side of the room; they will appear to have turned around, and will now be facing right to left. The result is a scene which will not cut together.



(left) This sounds difficult, and many new directors get confused by it. However, if you imagine two characters talking, and draw a line between the eyes of one and the eyes of the other, all you have to remember is to keep the camera on one side of that line. Then you'll have no problem.



(above) These two shots will cut together well, as they're both filmed from the same side of the line. The figure in blue is always at the right-hand side (of the line) looking to her left. The figure in black stays at the left-hand side.



(left) This shot will look odd when cut into the above scene, because the camera has crossed the line. The figures now appear to have swapped position (confusingly).

Common formats

▸ Home video (VHS, VHS-C, 8mm)
Not brilliant quality, but better than it was. This format is fine for holiday videos and babies, and you'll get away with using it for Internet and CD-ROM productions. However, if you can borrow a decent camera, you'll see the improvement.

▸ S-VHS/Hi 8
These are still home video formats, but results can be very impressive. We're using a Panasonic SX30 S-VHS camera for our film project and, as you'll see, the footage looks sharp and clear. Use this kind of camera for work that will end up as desktop video (ie not for general broadcast).

▸ Digital
Truly digital video cameras started to appear a couple of years ago. They may still be a little out of the league of the home user, but they're gaining respect in the broadcast industry. The BBC regularly transmits material shot on digital media. One of the big ideas of digital video is that you can take the footage directly from the camera into your PC without any drop in quality. However, not all capture cards are designed to work this way, and you might end up having to re-digitise your footage from the camera, living with the loss in quality.

▸ Betacam
Professional TV camera. You can rent one from about £100-£150 per day (either from a production facilities house, or a freelance cameraman). These cameras tend to be a little less forgiving about light levels than home video, but they will give you broadcast quality footage (of course you'll lose some of that quality when you digitise). In addition, most Betacam cameras won't play out the footage, so you'll have to arrange to digitise from a separate Betacam player – very pricey.

▸ Film
Make your movie on film and you'll double the time taken to light your set, treble the cost of making your film, and quadruple the amount of hassle you'll have to go through to edit it. On the plus side, you'll gain a lot of respect from people in the film industry (who can smell videotape a mile off, and won't take you seriously if you use it).

⇨ it needs to be transformed into a shooting script. The director has to try to work out what the writer is trying to do (not that hard in this case, since we're both writer and director), and turn it into a sequence of shots to be filmed. Usually, practical considerations will mean that many of the shots will have to be recorded out of sequence, but we've tried to keep that to a minimum, so the actors know where they are, and how to react.

Once upon a time

This is where the storyboard comes in. Depending on your style and the size of your production, storyboarding can involve full colour paintings of every shot in the film, or a few notes scribbled in the margin of the script. Since we're also the cameraman on this film, we have a pretty good idea of what we're looking for in each shot. Also, we're trying to avoid pinning down the sequence of shots in the final film too firmly, so we have as much freedom in the edit as possible.

Our storyboard consists of a few 'covering' shots for each scene, and then some close-ups and cut-aways to break it up. We have some strong ideas about the style for most of the scenes, but we're shooting far more footage than we need to cover ourselves. Tape is cheap, and it doesn't take that much longer to record an entire scene in

> *"Getting your footage into the computer is simply a matter of plugging the camera into the capture card, choosing the best quality settings you can, hitting Play on the camera, and clicking the Capture button"*

close-up than it would to tape just the lines you know you're going to want close-ups on.

We've gone for a lot of interior scenes because shooting indoors is easier than shooting outside. A reasonably soundproof house can be lit and set up as you wish, and is usually immune from intrusive traffic noise. Outside, however, you have to contend with weather, traffic, aircraft noise, unwanted spectators and randomly varying light levels. If you can avoid it, do. If you can't, try to think well ahead about your locations. Visit them at different times of day, watch the light, and listen to the background noises. Don't, as has been done before, choose to shoot between a power station, a lorry park, a school, and a commercial waterway.

From can to disk

Okay, so filming is over. You'll probably want to sleep for a week, but you'll be so keen to look through what you've shot that you'll be up at dawn to start digitising your footage. At this point, you should have a log sheet on which your production assistant has listed every shot, where it is on the tape, and how usable it is. However, this is the real world, and unless you work for the BBC (or are on a training course), you won't have a log sheet. You'll just have to watch everything, and decide whether to digitise it there and then.

Getting your footage into the computer is simply a matter of plugging the camera into the capture card, choosing the best quality settings you can, hitting Play on the camera, and clicking the Capture button. As the camera plays, the software will digitise the footage straight onto disk.

The only art involved is in choosing what to capture, and what quality to digitise it at. For the record, we've captured our footage at just over 1MB p/s at a 720x540 resolution. That gives you an image on which you can't see the pixels, but still gives you a good half an hour's video on a 2GB disk.

Try not to digitise great long chunks of video simply because it's easier; clip out short scenes, and give them sensible names on the disk. That way, when you come to edit, you'll be able to find what you're looking for quickly and easily.

And that brings us to the edit – the subject of part two (p62). This is where we discover just what we got right in our frantic filming session, and what we can do to rescue the rest.

The digital post-production suite

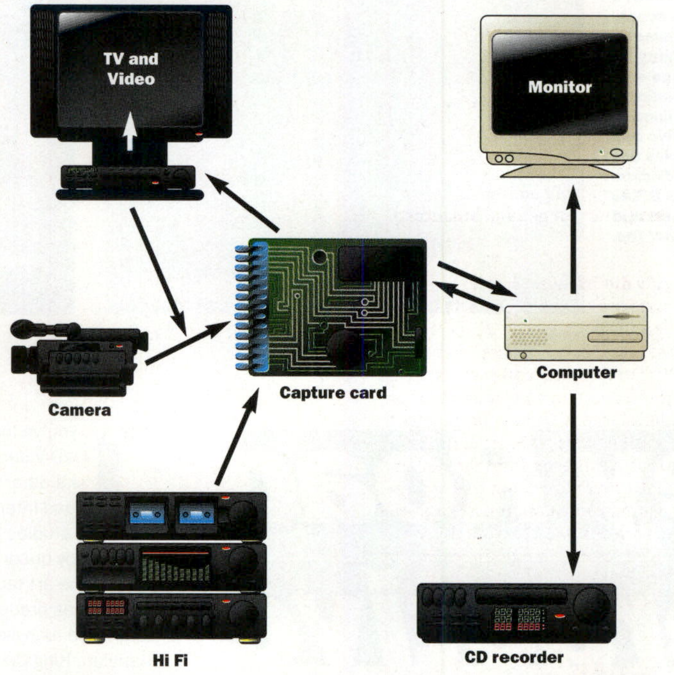
The edit set-up we're using (as shown below) consists of a PC, a capture card and a CD-ROM recorder. We've taken the output from the capture card to a video player and a TV, so we can watch our footage on a separate screen while we edit.

We can also use the video player to play in any VHS material we might need to digitise. In addition, we've got a camera from which we can play the shot footage directly into the computer, and a hi-fi to digitise any sound clips (such as incidental music) we might need for the production.

The system we're using consists of:

Hardware:
Pentium Pro Overdrive (333MHZ) PC with 48RAM
3x2GB Maxtor Disk drives
Pinnacle capture card
Yamaha 4260 CDR
Panasonic SX30 S-VHS camcorder

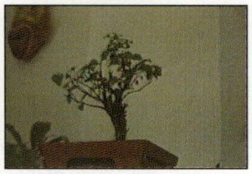
Software:
Premiere (video-editing)
Photoshop (image-manipulation)
After Effects (special effects)
3D Studio MAX (3D modelling)



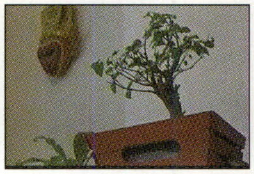
Format wars

There are several workable formats for shooting video, all with their own advantages and disadvantages. Broadly speaking, you should shoot on the highest quality video format you can – even if your finished video is only ever going to end up as a postage stamp-sized display on a Web page.

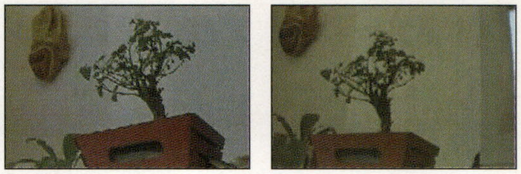
There are two reasons for this. First, setting up a shoot is time consuming, and you don't want to do it all again if you re-render your movie at a better quality later on. Second, if you start with high quality footage, the pictures will be cleaner, sharper, with less video 'noise'. So, when you compress them down to their final resolution, you'll get a better result, and probably smaller files.



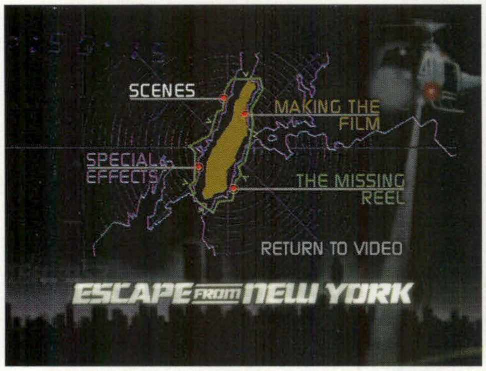
This picture was shot with a VHS camcorder.

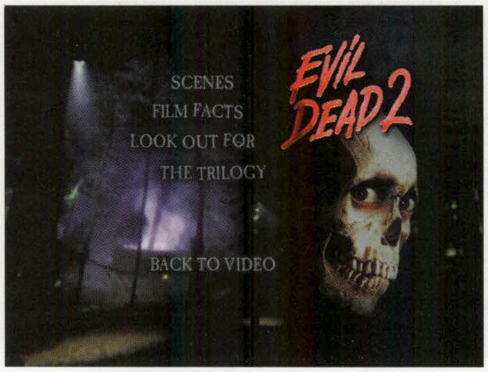


This image was shot with an S-VHS camcorder. It's sharper and the colours are brighter.

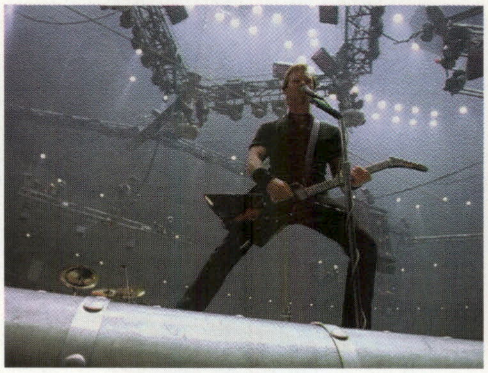


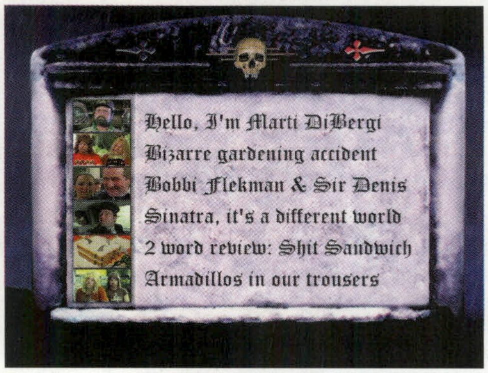
When compressed (as for playing from a CD-ROM or the Internet), you'd expect the difference in quality to disappear. Instead, if anything, it becomes more pronounced.





DVD production isn't just a case of slapping digitised footage on a disc. Abbey Road Interactive handles the entire process, creating many of the assets, laying out interfaces, coming up with animated menus and sub-games, and generally finding a way to make the extras included with many discs attractive and interesting. These examples are from the DVD editions of *Escape from New York*, *Evil Dead 2*, *The Graduate*, a Metallica concert and *This is Spinal Tap*.




Hello, I'm Marti DiBergi
Bizarre gardening accident
Bobbi Flekman & Sir Denis
Sinatra, it's a different world
2 word review: Shit Sandwich
Armadillos in our trousers

Abbey Road Interactive

That famous studio in North London isn't just about The Beatles, a zebra crossing and hordes of tourists – there's a world-class multimedia company throbbing away in the heart of it...

If you've looked at an Enhanced CD (E-CD) or a UK-bought DVD-Video title lately, chances are the graphics, menus and other interactive content were created by Abbey Road Interactive. This division of the famous Abbey Road recording studios was only established in February 1997, but it has already quadrupled in size and moved to a spanking new state-of-the-art facility.

ARI has produced E-CDs for many top artists, including acts as diverse as Kylie Minogue, the Spice Girls, George Michael, Marillion, King Crimson and Iron Maiden, along with numerous classical titles. Its Single Byte template enables the quick production of singles and EPs, usually within four days.

Thanks to the range of sophisticated equipment available – some of it customised kit unique to the company – DVD production at ARI is well advanced. ARI can handle the complete process, from pre-processing and MPEG-2 encoding to authoring and interactive design – all backed up by the world-famous sound recording and remastering capabilities of Abbey Road Studios, of course.

Many DVDs feature the full gamut of possible features: multiple camera angles, surround sound, multiple language tracks with subtitles, animated menus, photo galleries, and DVD-ROM material. Recent titles include *Evil Dead 2*, *The Graduate*, *This is Spinal Tap* and *Escape from New York*. As if that weren't enough, ARI produces the odd Web site too, such as those for speaker manufacturers B&W and The Town House recording studios.

In short, ARI mixes considerable technological expertise with state of the art equipment and, most importantly of all, a highly creative, inspirational team... ca>s

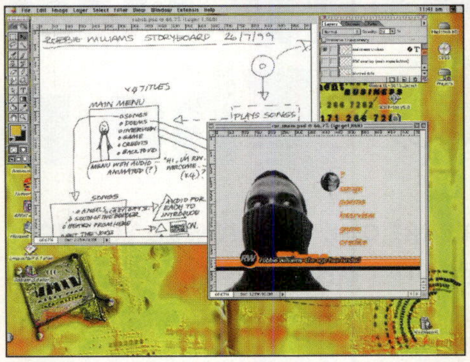
Information

*Contact Abbey Road Interactive on **t** 0171 266 7282, **e** interactive@abbeyroad.co.uk or **w** www.abbeyroad.co.uk.*

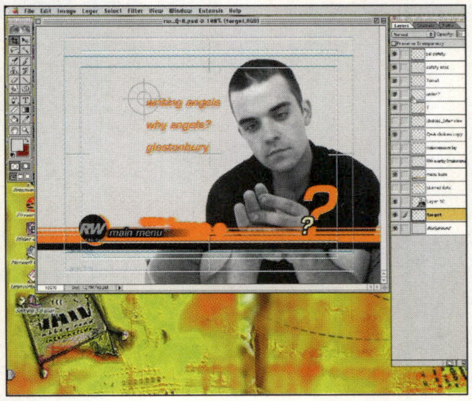
Producing a DVD-Video title

There's much more to it than mastering a VHS tape, you know...

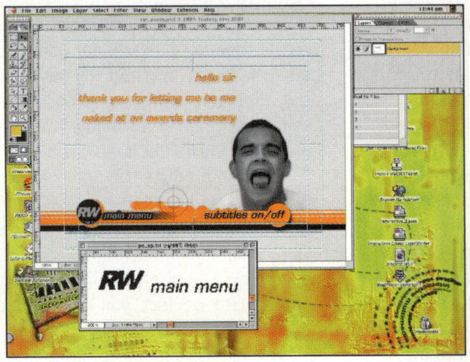
1 Define the product! In this case it's an EP for Robbie Williams. Following a briefing from the client, it was agreed that this DVD would be created for the UK market, where Robbie is established, and the US market, where he is just being introduced. Fans would get special extras recorded and/or created for the DVD, to showcase the format's potential.



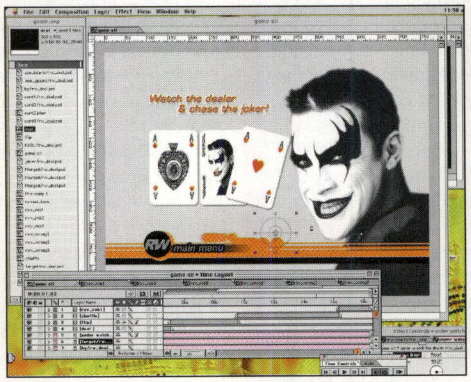
2 Brainstorm and storyboard. For this disc to be different from the other music DVDs it needed more interactivity and the personal touch. So Robbie recorded some welcoming footage and we created a game based on his 'Joker' character. The storyboards generated at this stage are the backbone for sign-off, design and authoring.



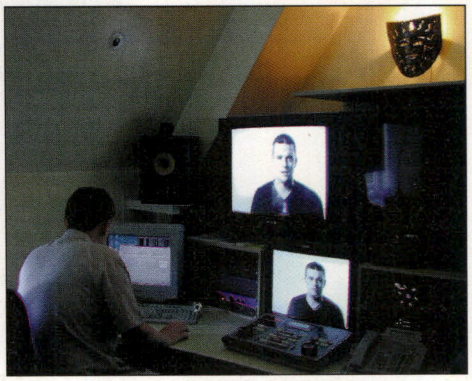
3 The menu screens. This step is not as straightforward as it might seem. We need to create two discs: one for NTSC and one for PAL. Each format has a different safety area and shape, so the design must fit with each to avoid duplication.



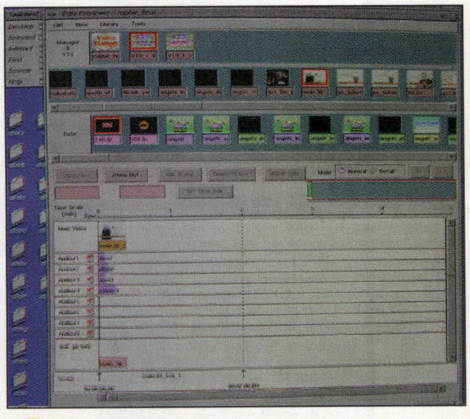
4 Overlays. Creating the highlighting overlays is a complete nightmare. Each overlay can use a maximum of four colours (and one of those is usually transparent – so in reality there are three). Another problem is that you cannot anti-alias. As for lining them up with the background graphic in the authoring program, this requires calling on the black arts.



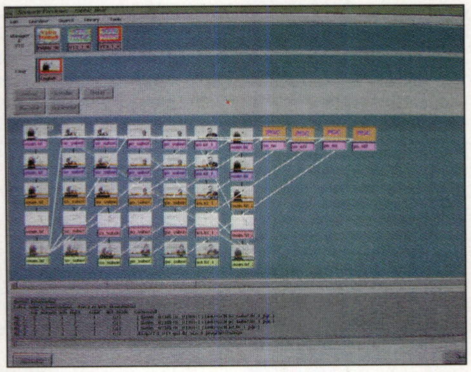
5 Animating the game. The game is a series of animated menus. We create the animation in *After Effects*, since it slots comfortably in with *Photoshop* and *Media 100*: the latter to create the screens and *Media 100* to lay the sequence to tape ready for encoding.



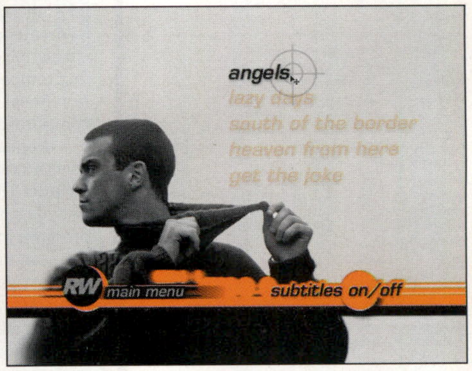
6 Encoding. While we're creating the graphics, the video and audio is encoded. The video is encoded on an IBM Multipass encoder, specially developed for Abbey Road. Since there's only 35 minutes of footage on the disc, we can use the best compression rate for the highest picture quality.



7 Audio. This disc contains uncompressed linear PCM stereo, which is captured on a Sonic Studio system. There are elements of audio-only effects which are played under the menu screens. These have been edited together using the Sonics.



8 Authoring. The first stage of authoring is when audio and video are multiplexed (mixed) in the authoring tool *Scenarist*. During this step, each element of the disc is linked together and functionality is assigned to menu buttons and remote control commands. The DVD-ROM Weblink is also added at this stage, for those using the disc on a computer.



9 The final stage in DVD-Video creation is testing. The technology is so new that both the players and software can respond differently. The first level of testing is emulation, where a computer simulates DVD functionality. The second is cutting a test disc from the manufacturer – this step should never be left out! And that, barring panics, is that...

Desktop film-making

The rough edit

In part one we showed you how to get started on your very own blockbuster movie. Read on for tips on completing your first rough edit, and find out what to do if it all goes pear-shaped...

The first stages of editing can be the most exciting and rewarding part of any video project. It can also be the point at which you suddenly realise that the entire film just isn't going to work. If you've got it right, the initial ideas of the production – largely sublimated in the frantic rush of practicalities which characterise most shoots – should now resurface, and you should find out how they really fit together on screen.

Since we're not producing for broadcast, we don't have to worry about renting expensive equipment. All our footage is on hard disk, and everything we need to produce a finished film is in *Premiere*. We also don't have to worry about working sequentially. It would, at least in theory, be possible to work through the production one shot at a time, getting everything perfect and all the effects laid in before moving on to the next scene – as you would in an old fashioned 'linear' edit suite. In practice, *Premiere* frees you from the mechanical processes which created these constraints, and the way you edit your work is a matter of personal style.

Non-linear editing enables you to work on any part of your film at any time, so take advantage of it. It's best to roughly edit the key scenes so you can see what the film is going to look like, then fine-tune edits, insert close-ups or create effects.

Since you can watch the movie (or part of it) at any time, you can get a feel for the project as it evolves, and see more easily how the story flows. By becoming too obsessed with the detail at the start, you often find that you spend hours working on a scene – deciding whether the close-up is more effective a couple of frames earlier or later. Then, when you watch the finished film, you may find the scene is irrelevant anyway.

A word of warning, however: when you put together a non-linear edit suite, people will tell you that it will save you time. "You can do the same work in a third of the time," they'll say. This is a lie – and it's a lie because it's true.

You can produce the same work in a third of the time – but you won't be satisfied with it. With all the new tools at your disposal and with the possibility of infinitely altering every shot until it's perfect, you'll become a perfectionist. You'll end up spending longer than you did before and trying

Linear and non-linear editing

Which to choose – typewriter or word-processor?

Editing systems fall into two categories: the old linear suites, consisting of vast arrays of complex and temperamental machinery; and non-linear suites, consisting of a computer and a few input devices.

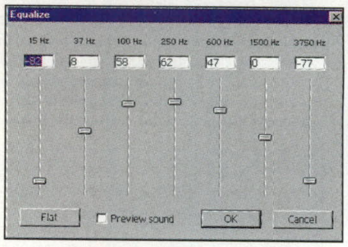
A linear suite at its most basic level is a video player and a video recorder. The first holds your original footage, and the second contains the program you're constructing. To edit, you scan through the footage to find the shot you want, copy it onto the recorder machine, then move on to the next shot.

If you choose this, you have to work consecutively – you can't go back and shorten or lengthen a scene, or cut out a shot. You have to finish the first scene before starting work on the second – however inconvenient that might be.

Conversely, on a computer (non-linear) suite, all your footage is on disk and is accessible at any time (no constant winding through tapes to find it). When you construct your film, you drag clips from your disk onto a Timeline. You can then move these clips around, alter them, lengthen and shorten them, add effects, or separate the video and sound without changing what's on the disk.

The result is that you don't have to work sequentially – you can throw together an opening scene, add on something from the middle of the film, then go back to fine-tune your first shot later on.

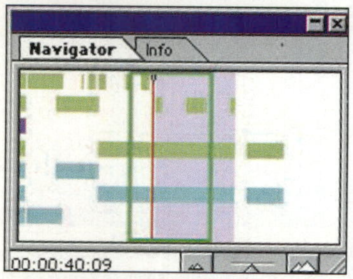
It's the difference between a typewriter and a word processor – it frees you creatively and enables you to work in your own way and your own pace. You can easily assemble the key points in your film, then work the rest in around them.



15 Hz: -82
37 Hz: 8
100 Hz: 58
250 Hz: 62
600 Hz: 47
1500 Hz: 0
3750 Hz: -77

☐ Preview sound

One of the new sound filters gives you control over the tonal qualities of your audio clips.



A graphical representation of the entire movie enables you to move around, and zoom the Timeline to work at whatever level you need.

masterclass: part two

Telling a story

Now we'll look at how we can use the shots we've taken to move the film's story on and develop the characters...

Here, our main character has invited a friend round – she wants to talk her problems over, but her friend is not really the listening type. She spends about an hour talking at our heroine and then leaves her feeling bemused and shell-shocked.

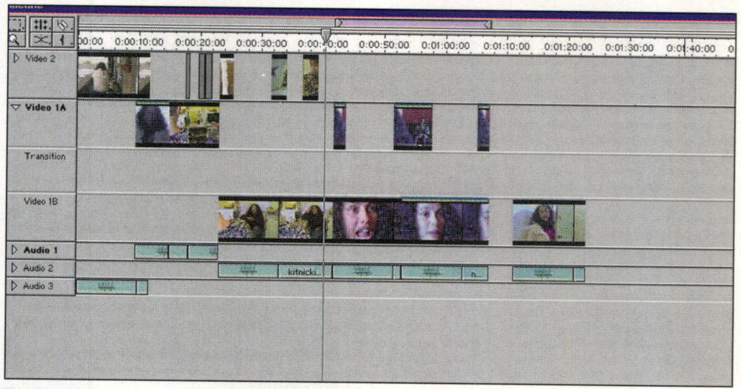
All this has to come across in a couple of minutes, and our heroine has precisely no lines. There are an infinite number of ways of shooting and editing this scene. Here's what we did...

1 First, a relatively straightforward piece of editing. The friend arrives at the door and is let in. Our only difficulty was in the second shot where we filmed the friend entering the house. The camera was set up in the hallway, and so when she opened the door, the light flooding in from outside created an unwanted effect as the camera fought to adjust. We experimented using *Premiere*'s filters to re-adjust the shot (we animated the brightness and colour balance to counter the effect of the sunlight). This worked reasonably well, but we eventually opted for simply cutting to the interior shot a couple of seconds later when the door was already closing.

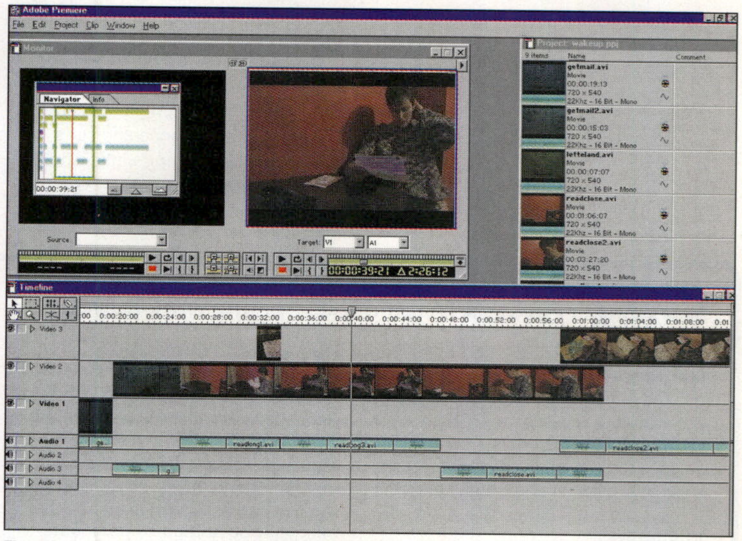
2 To get the effect of time passing, we split the scene into two parts (which we filmed in different rooms). We then made the friend's voice continue uninterrupted through the whole scene.

3 In order to get a progression into the scene, we then edited the two parts in very different ways. Our heroine has invited her friend over because she has something she wants to ask her about. So we made her quite active and attentive in the first section by using the over-the-shoulder shot to set up the scene. We then cut in a lot of busy cutaways of the tea-making process (most are shot handheld to give a more 'active' feel).

The effect was helped by making the visuals 'jump' in time while the voice did not. Hence, the kitchen section lasts less than a minute, and the dialogue comes in a seemingly uncut stream. However, our heroine manages to make and drink a cup of tea in that period, while still finding time to clean her window sills! To make this more real, we didn't set up any of the shots – we just asked the actress to make a cup of tea, and filmed what she did. →



The Timeline can be set to show larger or smaller portions of your project.



The whole *Premiere* screen can get a little cluttered if you work at low resolution.

out every permutation of an edit before settling on the idea you first thought of.

Working with Premiere

On loading up, *Premiere* can look a little daunting – but it doesn't take long to get to grips with the program. Once you've imported your carefully named footage files (and any other sound effects, titles, animations and still images) into the program's Project window, you can begin to think about how the film will fit together.

The key to *Premiere* (or any editing package) is mastering the Timeline window. Put simply, the timeline is a graphical representation of your movie. It's divided into as many video and ⇒

> *"It's best to roughly edit the key scenes so you can see what the film is going to look like, then fine-tune edits, insert close-ups or create effects..."*

audio tracks as you care to add, and to place elements into your production, you simply drag-and-drop them into the appropriate position on the timeline, and then arrange them.

And for simple editing, that's all you need (see the boxout 'Six steps to your first edit' below). However, *Premiere* offers a lot more than simple 'cuts' editing. By right-clicking, you can manipulate a clip in various ways. You can play it at different speeds, freeze-frame at any position, or give the clip a motion path through your screen. Perhaps the most important option here is the Filters list. Click on this, and you will be given a whole range of ways to alter your video.

If you have a passing knowledge of *Photoshop*, many of the filters will be quite familiar to you: Brightness & Contrast, Colour Balance and Lens Flare are all there, along with a whole host of other options such as Blur, Twirl and Ripple. If you're adding a

→*Continued:* Telling a story...

4 The second part of the scene is a complete contrast. The voice carries on throughout, but the editing style is very different. It's now some time later, and our heroine has given up any attempt to be a part of the conversation. There are only two shots here. The first is a completely static over-the-shoulder shot. Here we see our heroine sitting transfixed on the sofa, her tea mug half way up to her mouth. The second shot is a big close up of the friend. She's very animated, and fills the screen completely.

In order to make the monologue more natural, we got the actress to add to the written dialogue by ad-libbing in character. We asked her to talk about her day, recorded it, and cut parts of that in with the scripted words.

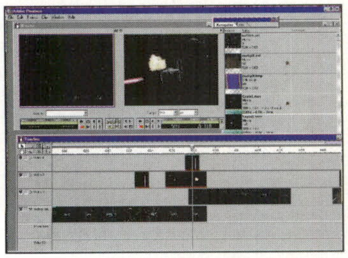
5 The scene ends with the friend leaving. We cut this shot in very sharply so that she shoots out of the door almost before the audience can take in the fact that she's gone. Finally, we're left with silence, and our heroine standing shell-shocked in her hallway. You can see from the shots above how opening the door seriously affects the colour balance and quality of light.

Using tracks Making the Timeline work for you

At the top of the Timeline are the video tracks. There are three video tracks by default (1a,1b, and 2), and you can drop your clips into any of them. If you've got video in two separate tracks, only the top one will be visible on-screen. So what's the point of multiple tracks?

1. Cutaways

You've filmed a cookery demonstration, and the main shot is the cook preparing a meal. They're talking all the way through the recipe, and you want to use that shot practically uncut throughout. However, you've also shot several close-ups and cutaways which illustrate the recipe, and you want to put them in too.



An example of multiple video tracks to create a composite shot.

You can do this by dragging the main shot onto the bottom track, then pick out your cutaways and drop them into the top track at the relevant points. Now, when you hit Play, you'll see the main shot most of the time, and the close-ups wherever you've placed them. The chef's voice will also continue throughout.

2. Transitions

To go from one shot to another using anything other than a straight cut, you need to use more than one track. This is simply because more than one video clip is on the screen at the same time. Take the standard dissolve, where one shot mixes slowly into another. Both shots need to be on the screen during the dissolve, so we need two tracks. We need a third track to put the transition itself in.

Premiere contains loads of types of transition – but most are pretty pointless. There's nothing more distracting in a film's most sensitive moment than to have the entire screen flip over onto its side, and then shatter into a thousand star-shaped pieces. The straight dissolve is all you usually use in a drama, and a few of the wipes can come in handy if used with discretion. See the scene changes in *Star Wars*, and Tarantino's occasional use of split screens in *From Dusk Til Dawn* and *Jackie Brown*.

3. Keying

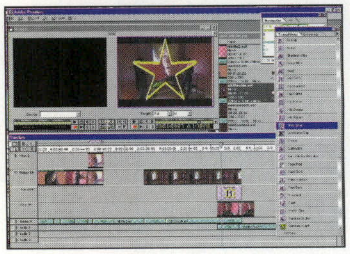
You may want to construct a composite shot by combining more than one clip on the screen at the same time. For example, you may want to make part of one image transparent, and enable another video clip to show through. You may want a 'picture in picture' effects, where a small version of one clip plays in another.

We'll be dealing in depth with these effects next issue, but briefly, you need to put each layer of the effect in a separate track, and then use the transparency option to make an area (usually a certain range of colours, or a given shape) disappear. Anything on the next track down is then visible through the clip.

You don't usually need masses of tracks unless you're doing a complicated effect. Our record is seven (a spaceship battle). We had about four separately rendered 3D animations, a background, an explosion, and some laser bolts – all on screen at the same time. In our film, we've rarely needed more than two.

Under the video tracks are the audio tracks. You can import .wav files into these tracks or use the audio from your footage. You mix audio by layering tracks of dialogue, music and sound effects. You can adjust the relative volumes of each clip by clicking the arrow next to the track name – this expands the track. Now click on the (red) volume line and drag it up or down. You've now created complicated level changes quickly and easily. (In a linear suite, you'd have had to do this by hand, as the material was dubbed.)

If you want to separate the audio and video, you can either delete the video track altogether, or 'lock' it using the right mouse menu. This keeps the video in the same position while you drag the audio round on the Timeline.



Transitions – don't do this in a drama!

filter to a sound clip, you'll get choices such as Echo and Graphic Equaliser. (Better sound filters are probably the most important advance *Premiere 5* has made over its predecessors.)

You can also animate most of the filters (the Filters window presents a timeline of its own on which you can create keyframes to alter the values of your filter). This means, for example, that you can create a Lens Flare which sweeps across the screen, or animate the blur to create that classic 'passing out' effect. You can also layer as many effects as you like on a clip, and unlike in *Photoshop*, the effects don't change source material. This means you can go back and alter them any time.

See it in action

In order to see your filters in operation, you can drag the playback head over them while holding down Alt. This gives a non-real-time rendering of the effect. To see them as a full motion video, you need to preview the clip. First, select the clip as the work area (by dragging the markers at the top of the Timeline window out to cover your clip), and then select Project/Preview.

Apart from the filters, right-clicking also gives you access to 'Ripple Delete'. This removes a shot from the Timeline, and then shuffles everything else up in order to close the gap.

We'll be covering some of the more involved techniques *Premiere* has to offer in the next two issues, but for now, a couple of final tools are worth mentioning to help you get started with the program.

First, there's the Razor Blade tool. To slice a clip in two once it's on the Timeline, click on the Razor Blade tool near the top left of the Timeline window. This enables you to make invisible cuts in your clip so you can treat it as two separate pieces of video (once you've made the slice, click on the Arrow icon to get your normal cursor back).

Second, there are transitions. To create any transition other than a straight cut, drag a clip into the second video track (track 1a) and another into the bottom track (1b). Now position them so that they overlap by about a second. Next, select Window/Show Transitions, and pick a transition (Cross Dissolve is the most common). Then drag the transition into the Transition layer (between tracks 1a and 1b), and drop it on the overlap between your two shots. Note that transitions will need to be previewed if you want to see them work.

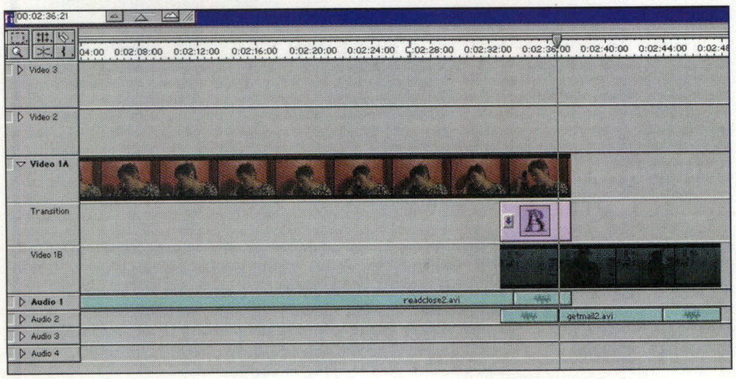
Third, there's the Navigator window. This enables you to zoom the Timeline window so that you can choose to work at whatever scale is most useful at the time.

Once your scene is finished, it's time to export it as a finished .avi movie. Choosing the right compression codecs and parameters can be a time consuming and difficult business, and will depend on where your work is destined to appear (on video, CD-ROM, or the Internet). We'll come to that in part four of this series. *Premiere* has a selection of presets for rendering, so you can get started with relative ease.

In part three (starts on page 68), we're dealing with titling, and constructing some special effects. Why do we need special effects in a film set in a council flat in Deptford (with no aliens, monsters, or pyrotechnics)? Well, there are many digital effects that are more difficult to achieve than anything to do with a spaceship – real life effects. ca▸s

Information

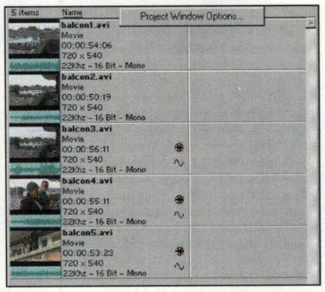
*You'll find raw footage from the film and a demo of Premiere 5 on the CD – so you can have a go at putting a scene together too. To use the movies for this tutorial with the demo, you need QuickTime 3 (**W** www.apple.com/quicktime) or above. Expertise supplied by Christian Darkin at **e** christian@darkin.demon.co.uk*



Premiere **offers far more than just simple cuts – you can use it to move between scenes with a variety of transitions too.**

Six steps to your first edit

Here's how to build up to the moment...



balcon1.avi
Movie
00:00:54:06
720 x 540
22Khz – 16 Bit – Mono

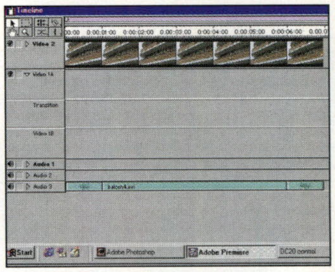
balcon2.avi
Movie
00:00:50:19
720 x 540
22Khz – 16 Bit – Mono

balcon3.avi
Movie
00:00:56:11
720 x 540
22Khz – 16 Bit – Mono

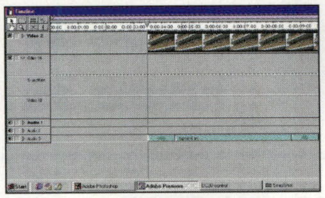
balcon4.avi
Movie
00:00:55:11
720 x 540
22Khz – 16 Bit – Mono

balcon5.avi
Movie
00:00:53:23
720 x 540
22Khz – 16 Bit – Mono

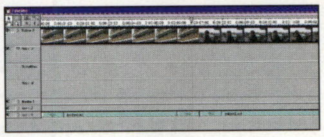
1 Assemble your footage – import the elements you need for your scene into *Premiere*'s Project window (video clips, sound effects, still images, titles and so on). Each clip is now named, and its first frame displayed as a thumbnail.



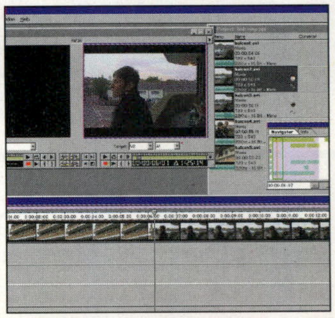
2 Insert your first shot – choose the take you intend to use for the opening of your scene, drag it from the Project window into the Timeline window, and drop it onto a video track. It appears as a strip of images here, and its associated waveform also appears below in an audio track.



3 Adjust the in and out points – drag the playback head (the triangular marker on the time display at the top of the Timeline) back and forth to find the start of the useable portion of your take. Leave the playback head there, move the cursor to the start of your clip (this changes to indicate when you've reached the 'in point'). Drag this point to where you left the playback head. Repeat the same process to locate and set the end (out point) of your shot.



4 Insert the next shot – go back to the Project window and grab a close-up shot. Drag this onto the Timeline and shorten it as above. Now grab the middle of the clip, and drag it to the end of your last shot.



5 Play your edit back – drag the playback head to the start of your work, then go to the Monitor window and hit Play. Your scene is played for you with the edit in place.

6 Continue in the same way until you've finished your scene – don't worry about being exact at this point, as you can always go back and fine-tune your edit points later. You can also insert shots by dropping them at the join between two shots, or remove them simply by hitting Delete (or Ripple Delete).

Remember: nothing you do in the editor will alter your digitised files, so feel free to experiment with the footage. Don't sit around wondering whether something would work – just try it out!

The ultimate magazine for computer-based creatives

computer arts
Britain's biggest-selling creative magazine • Mac & PC
2nd CD FREE! Software worth £348
FREE! Extensis
Mask Pro 1 & PhotoFrame 1
Director 7
Build superb integrated Website and CD interfaces – tutorial & demo
Photoshop 5.5
New Web tutorial
All in Real-Time...

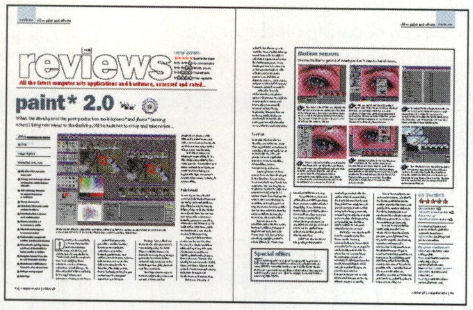
Every month, *Computer Arts* brings you the latest in...

- Graphic design
- Illustration
- 3D modelling & animation
- Image-manipulation
- Multimedia & Web design
- Digital video

- **Issue 37 on sale 4th October**
- **Issue 38 on sale 29th October**

Computer Arts step-by-step

Covering every angle of computer-creativity, here's how we make *Computer Arts* magazine work for you...



1 Every month *Computer Arts* brings you at least three major tutorials, showing you step-by-step how to get the best from packages such as *Photoshop* – and also covering topics like 3D modelling and rendering, multimedia and Internet design, plus illustration. Each tutorial is accompanied by a software demo and image elements on the CD-ROM.

2 To help you make your artwork even better, we bring you the latest and greatest artwork from around the world. Here, book jacket illustrator Steve Rawlings shows how he brings his images to life. Other big names that have featured in *CA* include The Designers Republic, The Attik, Stylorouge, Vaughan Oliver and more, along with many newcomers...

3 To make sure you've got your hands on the best possible kit, every month we review the latest creative software and hardware available for your PC or Mac. Our scoring system sorts the wheat from the chaff. Add to this a group test for every issue, and a monthly-updated full Buyer's Guide listing on the CD, and you can go shopping in confidence!

Subscribe to Computer Arts & save up to 25%

No-nonsense, no-frills, no-gimmicks, money-off deal...

Normal rate for 6-issue subscription: £30

Special offer 6-issue subscription: £22.50

Normal rate for UK 12-issue subscription: £60 Special offer 12-issue subscription: £45

Special offer 12-issue subscription for Europe: £73.53 (save £10 on normal rate)

Special offer 12-issue subscription for Rest of World: £86.53 (save £20 on normal rate)

How to subscribe:

- Complete, detach and return the card above left
- Or call the hotline on **01458 271 108**
  Please quote order code: **SPCLP04**
- Overseas readers call: **+44 1458 271 108**
- Or send a fax to: **01225 822 523**
- Or via the Web at: **www.computerarts.co.uk**
- Or via e-mail to: **subs@futurenet.co.uk**

Specials

Computer Arts Specials are **not** included in the standard *Computer Arts* subscription rate. See **page 98** for details on ***Specials* subscriptions**

image manipulation • 3d • graphic design • illustration • multimedia • web design • digital video • new technology
computer arts
every issue with dual format CD-ROM
issue 32 june 1999 £5
Britain's biggest-selling creative magazine ¥ Mac & PC

& get a Limited Edition cover

All *Computer Arts* subscribers receive a unique limited edition copy with the cover image intact and uncluttered with words.

& get a free binder!

...you'll also get another FREE gift – an exclusive *Computer Arts* binder – worth £6 – when you subscribe by Direct Debit.

Desktop film-making

Effects and titling

WITH THE MOVIE SHOT AND ROUGHLY EDITED, OUR FILM IS STARTING TO TAKE SHAPE. THE THIRD PART OF OUR DIGITAL VIDEO SERIES LOOKS AT TITLING, PLUS AN INCREASINGLY IMPORTANT AREA IN MODERN FILM – THE SPECIAL EFFECTS...

Once you're committed to editing your production on a desktop PC, a whole world of effects possibilities open up to you. You're no longer restricted to the simple captions, titles and effects available in most editing suites; nor the specialised and expensive procedures used by top of the range post-production houses.

Once you've digitised your footage, you can do anything with it. From running it through specialised programs designed for morphing (or 3D animation), right down to exporting sections of the movie frame-by-frame for editing in *Photoshop*. You probably can't match the latest blockbuster, but if you've got the time and inclination, you can make a pretty good stab at it.

Central to any effects scene is the idea of combining many different shots to produce one composite picture. When you see Godzilla bursting through an exploding building on a stormy New York night to make a grab at a passing helicopter, the chances are that the monster, the helicopter, the buildings, the explosion and the rain are all effects layers filmed separately (unless you see it in real life, in which case you're in trouble).

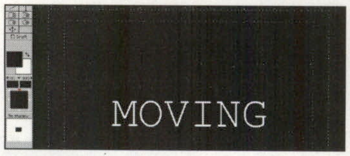
We combine these separate layers using a range of techniques. The most important of these is colour-keying – the same technique used to put Michael Fish into place in front of his weather map. Put simply, colour-keying enables you to pick one colour – or a range of colours in one video image – and replace just that part of the image with another video shot. In this way, the two shots appear to be one.

In the case of the weather forecaster, the meteorologist is filmed in front of a blue cloth (and told not to wear anything blue!). The blue is then keyed out, and replaced by a video image of a weather map. In the case of *Godzilla*, the whole process is more refined, and there are more effects layers – but the effect is the same.

Premiere handles keying very well, and right-clicking on a clip in the timeline enables you to select various types of transparency: from chroma-keying (where you select a colour to become transparent); to luminance (brightness keying – not used that often); and matting (where you use

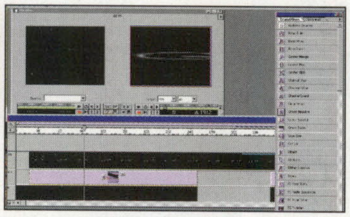
Opening titles

To create the opening titles for the film, we opted for a simple but effective system. Using *Premiere*'s titling functions, an interesting wipe plus a filter, we created a distinctive but not too overstated style...



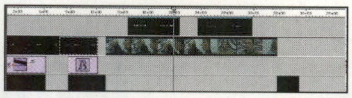
1 **With File>New>Title, we called up the titling dialog. *Premiere* enables you to create basic title screens quickly (if you need anything elaborate, create it in *Photoshop* and import it).**

The controls are quite similar to most simple painting programs, and enable you to draw basic shapes and gradients. We produced a large black square covering the frame as the background, and then used the Type tool with the Courier typeface in white to type the title. Before the title can be used, it has to be saved to disk as a .ptl file, and then imported into the project. Using Project>Create>Colour Matte, we then produced a plain black background for the title to appear on.



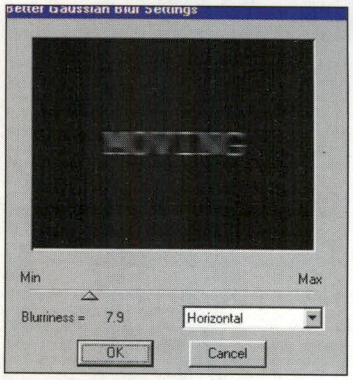
2 **Dragging the Colour Matte onto the timeline (on track 'Video 1b'), we stretched it to last around ten seconds. We followed this by dropping the title onto the timeline in track 1a above it, and overlapping by eight seconds (the length of time we want the title to spend moving onto the screen).**

Bring up the Transitions window and drag the 'stretch in' transition into the track between my two images. The transition resizes to fit the overlap, and you can see roughly what the effect looks like by dragging the playback head over the transition while pressing Alt.



3 **Once the title has appeared, it needs to stick around for a couple of seconds and then be removed. We're using a transition and a filter to achieve this. The transition is a cross-dissolve to the black colour matte. The procedure is as before, but in reverse (the black matte is placed on track 1b and extended past the end of the title, while the transition is dropped between the two).**

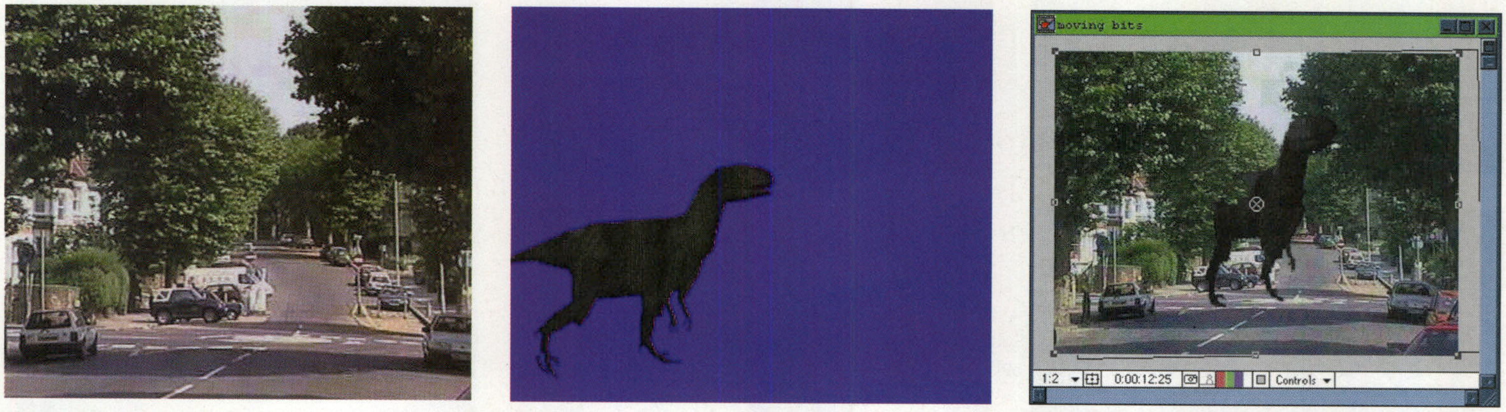
This produces a straight fade to black – the title slowly vanishing. That's fine, but a little dull. Right-clicking on the title graphic enables you to pick a filter to animate over the duration of the title's existence. We used the Gaussian Blur filter, and animated it so that the title defocuses slowly as it fades out. You can choose to blur vertically, horizontally, or both. We chose a horizontal blur.



Blurriness = 7.9
Horizontal

4 **To carry the theme on throughout the opening sequence, we're using the same blur-and-dissolve combination to make the names of the principle actors appear. In between the title screens, we'll eventually place clips from the opening scene of the film.**

masterclass: part three



Perhaps not quite the effect you saw down at your local multiplex, but shown above is an example of colour-keying. Whether it's used on TV or in blockbuster movies, the effect is substantially the same – using numerous layers filmed entirely separately and then composited. The likes of *The Phantom Menace* have upwards of 150 layers...

another image, or video clip as a mask). The last is useful if you want to make a complex shape transparent, as you can design a black-and-white mask in *Photoshop* and import it.

Strike a balance

However, there are things you have to watch out for. Most types of keying enable you to adjust the tolerance of the colour to be made transparent (just as you'd adjust it on the Magic Wand tool in *Photoshop*). Set it too low, and thick coloured lines start to appear around your keyed image; too high, and parts of the objects you wish to preserve begin to vanish.

Premiere's tools for coping with this are fine for most applications, but if you want to achieve perfectly invisible keying in an imperfect shot, nothing beats *After Effects* – particularly the *Production Bundle* version. This program gives you finer control over keying, with a number of tools designed for getting rid of lines, holes and colour 'spillage'.

Another keying problem – and this applies to any shot where you want to combine more than one element into a single scene – is moving cameras. If all your effects shots are done with a still camera mounted on a tripod, then when you combine the shots, you should have no problem. If one of the shots is taken from a moving camera, then you have to somehow copy that camera motion *exactly* onto all the ⇨

Titling conventions Who goes where?

There's nothing to stop you putting the credits of your productions in any order you like (unless you're working in Hollywood, where arguments over the ordering of credits have caused films to be abandoned). However, there are a few conventions that keep everyone happy.

With opening credits, you usually see the title of the production, its producers/writers/directors and so on, plus the principle actors credited. The exact order is up to you, but two possible sequences are:

TITLE
A film by
PRODUCER'S NAME
Written by
AUTHOR'S NAME
Starring
LEAD ACTOR
SUPPORTING ACTORS
Directed by
DIRECTOR'S NAME

Or, if you have very well known actors:

LEADING ACTOR
SUPPORTING ACTORS
In a **PRODUCER'S NAME** film
TITLE
By
AUTHOR'S NAME
Directed by
DIRECTOR'S NAME

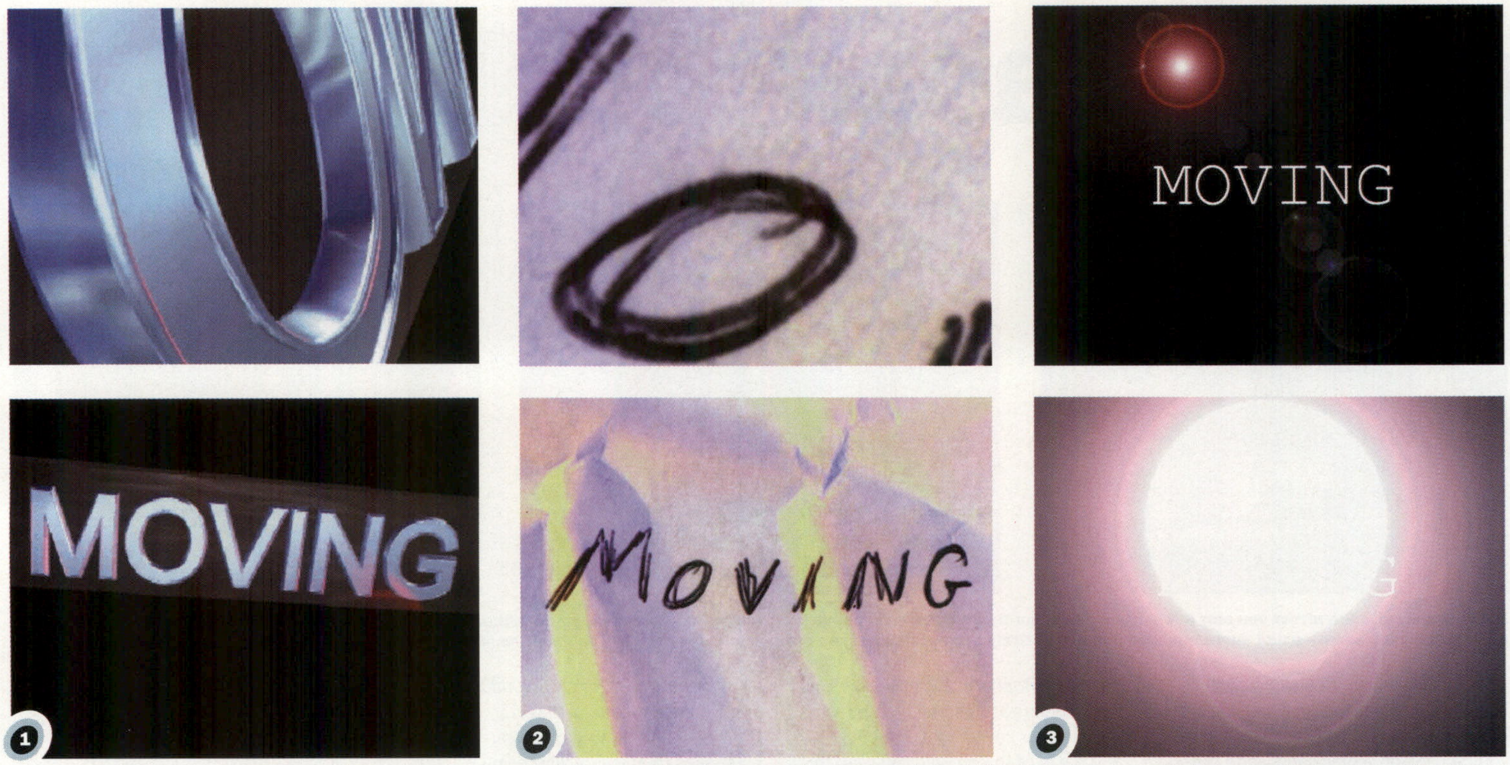
And what about the final credits? Well, again, the sequence is up to you – but usually, the cast members appear at the beginning of the list, followed by those of the top creative personnel who haven't already been mentioned at the start of the film. This means the director of photography, the editor, music and effects controllers, designer and so on. Further down come the lighting and camera people, runners, sound recordists, set-builders, accountants, assistants, groupies...

When you're putting the credits together, remember they're there for a reason: so you and the people involved in your production can get more work. This is true right from the Trainee Assistant Runner who takes his copy of the film to a job interview at a cable TV company, right up to the top Hollywood actor who can demand an extra couple of million for her next role because she got top credit billing on her last blockbuster.

If your film is good, the people who worked on it will want their work noted. This can be the main reason people get involved in low-budget film-making.

Here's a tip. When film distributors consider buying rights to a film, they'll often be swayed by the credit list. If a film has been made on a low budget, it might not look cheap – but if the credits only contain seven people, the distributor might think it can get away with a much lower offer for the rights.

Thus, it's quite common for the makers of low budget films to lie about the cost of their movie – adding a couple of million to the production costs, and inventing a whole list of crew members.



Featured above are out-takes from our first three attempts at the titling for our movie. As described in the main text, the first is too corporate, the second *too much*, and the third too sci-fi. Take a look at page 68 for the one we plumped for (and why), and check out the CD for the resultant movies we eventually rendered.

⇒

other layers of your effect. If you don't, then the result is that all your layers wobble separately around the screen and the effect is ruined. (Think of *Dr Who* and you'll know what we mean.)

Get the effect

You may be able to get away with a smooth camera movement if your layers don't need to appear to be touching – such as Superman flying over a city. Generally, however, you should avoid moving effects shots if you can. The only alternative (if you can't afford professional motion capture cameras – which unless you're George Lucas, you can't), is to use another feature of *After Effects*: motion tracking. (This is only available in the *Production Bundle* of the software)

Motion tracking is a clever idea. Basically, you pick points on any piece of video, and the software steps through the clip one frame at a time – working out how those points move in relation to each other *and* to the sides of the screen. By doing this, it creates a motion path which you can apply to another video.

This means that if you motion track a hand-held shot of New York city, then apply the resulting motion path to a video of Godzilla shot against a blue background, you can key out the blue, and leave the monster standing in the road. You can then apply the same motion path to any other effects layers you want to put on, and pretty soon you've got a blockbuster.

The only limitation of this kind of motion tracking is that it doesn't work in 3D. You can track a camera moving from side to side, or rolling left or right, but you can't account for perspective changes, or zooming in or out.

You might very well think that there's no real place for special effects outside of a high budget sci-fi movie, but many of the most successful effects go completely unnoticed. For example, where keying is used alongside *Photoshop* to alter the background of a period drama by removing unwanted TV aerials and so on, and adding in contemporary details and buildings.

Roll credits

A film can often be defined by its titling styles. When you think of *Star Wars*, you think of that towering bold typeface set against the backdrop of space, and the film's opening narration receding into the distance. When you think of the film *Se7en*, you think of the sharp, flickering animation in which typed and scribbled words jump and flash on the screen. And of course, no Bond movie would be complete without its customary 'Gun sight Point Of View' shot of our hero spinning and shooting down the audience.

We experimented with several different ways of producing titles for our movie. You can see the results of our titling attempts in the three-step sequence (above right), and they're also all included on the CD, so you can see exactly what we mean.

First attempt: too corporate

Our first titling attempt was never going to be right. We decided to use *3D Studio* to produce a bold title graphic made of chrome, and sweep the camera over it in a series of curved passes. The idea is that the viewer doesn't discover what they're looking at until the very end, when the camera zooms out fully to reveal the title.

In the event, we kept the camera still and animated the title, but the effect was the same. *3D Studio* makes it easy to create text and fly around it, and the entire animation only took a couple of hours to create.

The result is good – by which we mean that it's a good example of what it was intended to be. If we were going to use it, we'd have had to refine the camera movement, and make the lighting a little more dramatic.

However, we decided not to use it. The problem with this sequence is that it hasn't been thought through. It's a piece of corporate logo animation which says nothing about the film.

Second attempt: too much

Our next attempt used the same kind of idea – discovering the title by zooming over it in close-up, then pulling out to reveal it at the end. This time, we did it with a hand-written title on a crumpled piece of paper, feeling that this was more in tune with the film.

We scanned in the scribbled word at a high res on a flatbed scanner, then used *Photoshop* to bump up the colour saturation for a more pronounced shading. We then imported the (huge) graphic into *After Effects*, and created a motion path in which the image could be zoomed, rotated and moved smoothly through the frame over time.

The rendered animation looked good – but perhaps too good. It was also overstated – the film is only 15 minutes long, so it somehow feels wrong to have a long slow sweeping opening shot full of giant letters.

Third attempt: too sci-fi

For our third title, we went back to *Premiere*. We produced the text using the program's own titling functions – no fuss, just plain white words on a black background. We used Courier as a typeface – no nonsense, yet still somehow speaking of creativity.

Starting with a black screen, we used one of *Premiere*'s many transitions to bring the title into view. Here, we used 'Slash Slide', where diagonal lines from the second image slide in over the first to replace it. With a black background to the title, the appearance is of just the letters moving, slowly raining down in stripes to create the title. Quite effective.

To get the title off the screen again, we picked a different effect. We used the Filters option to create an animated lens flare. The flare begins very small at the top of the screen, slides in over the title, and grows to a bright flash which burns out everything on the screen. When it vanishes, the title is gone.

This is very slick and certainly on the right track, but a little too shocking here. See the walkthrough on page 68 for the titling style we went for.

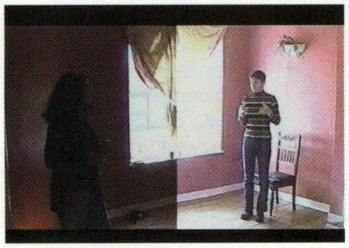
Once the movie's effects and titles are in place, we have to produce our final cut, and get our finished movie to its audience. In the next part, we'll be looking at the movie as a whole, and adding the finishing touches – the tightening of the edits, the cutting of unnecessary scenes, and of course, the incidental music which has to be produced for the film. We'll also look at different ways of outputting the final film.

Information

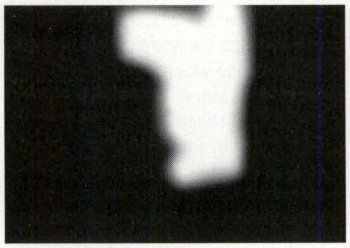
Expertise supplied by Christian Darkin. You can contact him on e christian@darkin.demon.co.uk

Blinded by the light

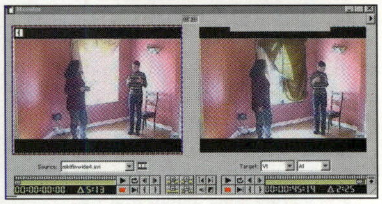
The problem: this shot includes a window, and sunlight is much brighter than lighting inside a room. To solve this, you could cover the window with a natural gel; flood the room with massive lights; or avoid the window altogether...



1 **Mount the camera (unmoving) on a tripod. Shoot the scene twice: once with the camera adjusted to the lighting outside, and once with the interior correctly exposed (as above).**



2 **Export one frame from the correctly exposed window shot into *Photoshop* and create a black-and-white matte so that the window is isolated from its background.**

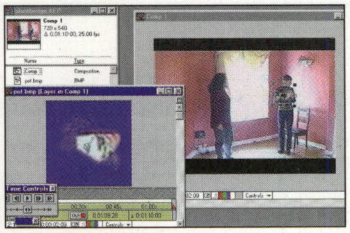


3 **Return the frame to *Premiere* (with the take which has been exposed correctly for the inside of the room), and use keying to superimpose one over the other. As long as nothing moves past the window in the shot, the appearance will be of a single shot in which the window and room are more or less properly exposed.**

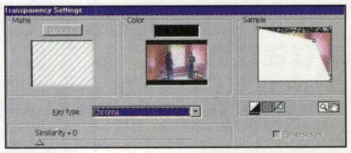
However, the only usable take where the lighting within the room was right, turned out to be a rehearsal. The shot involved the actress on the right holding a plant pot she'd just taken down from the wall. In the rehearsal, the pot hadn't been unfixed, so she just mimed it.

You could go back and redo the shot, but we decided to fix the shot in post-production. The idea is simple: take the pot plant from the wall as a separate video layer, superimpose it into the hands of the actress, and give it a movement path to follow her motion.

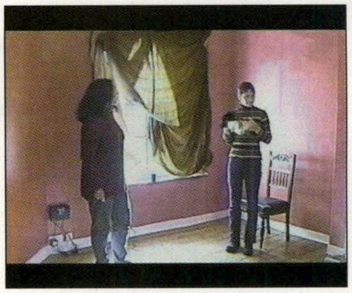
4 **We then exported a single frame from the rehearsal into *Photoshop* (a useful filter here is *Photoshop*'s Video/De-interlace option, which removes any annoying horizontal lines from the image).**



5 **We now produce two separate images: the first is a cut-out of the plant against a blue background. We used the Paint Selection tool to get a suitably accurate cut-out. The second image is of the wall where the plant has been removed from. Here, we used a soft-edged brush, plus the Rubber Stamp tool to copy another section of wall over the gap left by the plant.**



6 **Now to *After Effects* (*Production Bundle*). This is good at giving complex motion paths to images and video clips. It can even create a motion path from the movement of points in a video. Taking the actress' hands as tracking points, we allow the software to create a movement pattern from them. Then map that movement pattern onto the still image of the plant pot, and key out its blue background. Once rendered, the actress seems to be holding the pot. It's not perfect (no perspective change in the pot image as it turns), but it looks fine.**



7 **The final step is to import the doctored video shot back into *Premiere*, then superimpose the empty piece of wall over where the pot is still hanging – and that's it. A rescued shot, and only marginally less effort than going back and shooting it from scratch.**

Desktop film-making
The finished film

WITH OUR FILM PROJECT ALMOST FINISHED, ALL THAT REMAINS IS TO CREATE THE FINAL EDIT, ADD SOME SPECIALLY COMPOSED INCIDENTAL MUSIC, AND RENDER THE COMPLETED MOVIE FOR VIDEO, CD-ROM AND THE INTERNET...

So here we are, at the final leg of our celluloid journey. Over the past three parts we've shot our movie, done the rough edit and added titling and special effects. In the final masterclass, we turn our attention to tightening edits and improving sound.

With the rough edit completed, our film ran to around 20 minutes. That's too long for the plot, and some cutting was needed. There were obvious points for editing – where action didn't further the story, or it over-stressed something that was already clear.

Once we'd removed these and the story had been beaten into shape, the next step was to clear up the sound. Big problem. We wanted to be as portable as possible in setting up shots – we didn't want to be encumbered by lots of extra equipment and people. This meant that we decided to rely on the microphone mounted on the camcorder for the sound, instead of getting hold of a directional or boom mic for the shoot.

In retrospect, it would probably have saved edit time if we'd used one of these. The sound quality was not bad from the internal mic, and for the indoor scenes it was fine. Most of the film is shot quite close up and the mic picked up the sound well. However, in the outdoor scenes, there was a lot of traffic noise, and post-production work had to be done to minimise it.

You can never eradicate unwanted noise when shooting outside – wind, traffic, and aeroplanes being the worst offenders. The problem is not so much the level of this background noise, but the fact that it changes so much whenever you cut to a new shot.

For example, if you have a conversation between two people at a roadside which you shoot from two angles, you'll find that one shot is quite quiet – because the microphone is facing away from the traffic, and the other is almost drowned out by the engine noise because the microphone is pointing right at the road.

It's likely you'll want some traffic noise in the scene – it would sound odd without it, but you don't want the sound level to change every time you cut from one actor to another. Here are some tips in dealing with that awkward monster, bad sound.

What's that, you say?

First, you should reduce the entire scene to the level of the worst clip. Take a section of sound (with no dialogue) from the worst shot for background noise. Usually, you record such 'wildtrack' shots especially for this purpose. You can then copy this noise over the rest of the scene so that the sound level remains constant throughout your edit.

Second, you need to ramp the sound up and down. If you have relatively long shots, it's sometimes possible to create a sound overlap between each cut – when going from a bad sound shot to a good one, you allow the sound from the bad shot to continue for a short time under the good shot, and fade it out gently. This creates a less obvious cut.

Our third tip is to use graphic and parametric equalisation – and *Premiere 5* offers some very useful sound filters. The graphic equaliser

What is broadcast quality?

If you want to work for TV, you need to work at a higher quality than most home editing suites can cope with...

Our film – shot on a home camcorder – is never going to make it onto terrestrial TV. However, when we asked a friend in BBC post-production what exactly constitutes broadcast quality, the answer was that it's changing.

It used to be the case that there were only a few film formats and a few broadcasters – and the format you were using was either acceptable or not. Today, the decision seems to be a more aesthetic than technical one. If the creative quality of your work is high, then you can get some technical leeway. That still doesn't mean you can transmit just anything, but broadcasters today (even the BBC) can't afford – either financially or creatively – to reject real quality in programme making without serious consideration.

Most programmes are shot on one of the professional formats such as Betacam, Digital Beta and 16mm film. However, Hi 8 and S-VHS regularly appear in news, current affairs programmes and documentaries, and animations made with 8mm home movie cameras crop up too. There are also rumours about programmes made on S-VHS and Hi 8 being passed off as Betacam by producers who dub their video footage onto a professional tape for editing...

There are even independent movie makers experimenting with digital video to make cinema films – with the finished production being dumped onto film at the end to save money (if you want to make a film on video, you'll pay about £50 for the tapes – make it on film and you're laying out £10,000 on stock before you shoot a single frame).

As for computer animations – as long as you work at a resolution of at least 768x576 (that's as high as a PAL TV picture), and dump your work onto a digital tape, CD-ROM, or other professional medium at the end, nobody need ever know you didn't produce your work on an SGI machine.

The problem comes when you start combining digitised video and computer-generated effects. Here, in order to produce your composite shot, the software has to re-render the completed scene – just as though you were copying from one tape deck to another, and there's a resultant loss of quality.

masterclass: part four

should be familiar to you – it enables you to reduce or boost certain frequency ranges, and thus remove unwanted noise. The parametric equaliser is a finer grade tool for the same purpose – it enables you to choose parts of the sound spectrum to enhance or reduce, and adjust how wide or narrow the range of frequencies is that you want to affect.

For example, aircraft noise exists mainly at the lower end of the scale, so you can reduce it by cutting out the low frequency sound. Beware, however – the more you mess about with the tone of your clips, the more you will affect the overall quality of your actor's voices. If you do it too much, the effect can be quite noticeable.

More top tips

Fourth, if you have to shoot in a street while a carnival is going past, get some shots of it. And, if it's not completely inappropriate, cut it into the scene. That way it adds to the production instead of detracting from it.

Our fifth tip is to put some sound effects or music over the noise: you can often disguise bad sound by adding to it. For example, if you get back to the studio to discover the voice of a market salesman shouting his wares in the background, mix in the ambience of an entire marketplace in the background – then your lone voice will be much more at home. Alternatively, choose some incidental music which will mask, or harmonise with the errant sound in your clip.

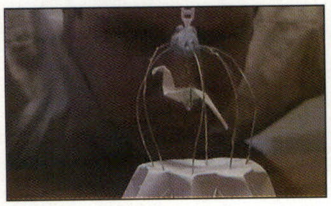
Thank you for the music

All of which leads us nicely to the music. A little incidental music in the right places can really turn your production from something interesting and clever, into a dramatic masterpiece. Ours was composed by a local musician using his own set-up of synthesizers and sequencing software. After watching the rough edit, he opted to create a couple of different pieces of music with a range of moods, which we could edit into the production wherever they were appropriate. He provided the music on CD which we were then able to copy onto hard disk, and import into *Premiere*.

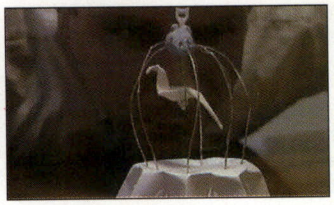
There were a couple of scenes that obviously needed music – the opening montage certainly did, so ⇨

Video compression solutions

You can output your film in many ways for different methods of distribution – but the quality varies...

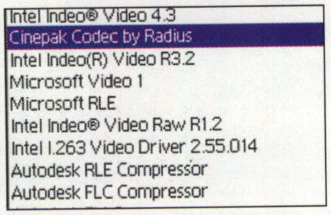


1 **Here's the movie at the quality we've been editing at: 1.2MB per second, digitised using a Miro DC20. The picture is sharp and clear, and when it's output to a video, you can't see digital noise (such as fringing around sharply contrasting areas of the image, or blocks of solid colour in low definition areas). That's the quality we're using to copy the movie to video. The finished film takes up nearly 1.5GB and needs a pretty fast hard disk to play back. (Most disks can match this kind of playback speed, but they can't necessarily keep it up for 20 minutes.)**



2 **Next step is CD-ROM quality. The speed of the user's CD-ROM (and the space you're allocating for video) determines your compression rate. At 150K per second anyone with a 2x CD drive will be able to watch the video. A 4x CD drive lets us go up to 300Kps without excluding viewers. But the maximum speed of a CD drive is the quoted one, and that's not the same as the sustainable read speed – so we won't take the video quality right up to the CD reader's limit.**

At 300K per second, our film will take up 300MB – nearly half the CD. It's too much, so we drop the quality.



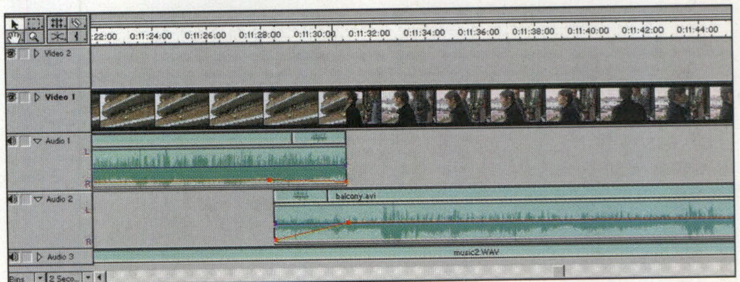
Intel Indeo® Video 4.3
Cinepak Codec by Radius
Intel Indeo(R) Video R3.2
Microsoft Video 1
Microsoft RLE
Intel Indeo® Video Raw R1.2
Intel I.263 Video Driver 2.55.014
Autodesk RLE Compressor
Autodesk FLC Compressor

3 **Once we know our data rate, we need to decide on a compression codec. This is the algorithm the computer uses to squash and un-squash your video. The better the codec, the better quality video you'll get for your data rate (and usually the faster your machine needs to be to play it).**

New and better codecs are coming out all the time, and they're usually available for free download. However, you can't always guarantee that your target audience will have the latest codec installed on their machine, and if they don't, your video won't play. We've picked Cinepak as our codec because most people have it, and it works reasonably well for video. There are better compressors (Intel for example), but none are so well distributed.

Whatever codec you're using, you can set up various parameters and settings within *Premiere* to determine how the compression is done. The most obvious being the resolution of your video and the data rate. However, there are lots of others, and the only way to get it right is to experiment. Just by getting the right balance between data rate and resolution, you can vastly improve your image quality. →

> *"It's likely you'll want some traffic noise in the scene – it would sound odd without it, but you don't want the sound to change every time you cut from one actor to another..."*



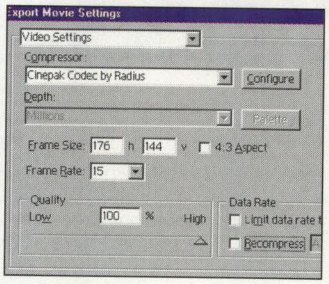
Overlapping and mixing the sound from two shots can make the different sound qualities of different shots less obvious.

we used *Premiere* to lay a music track. Using the Rubber Band underneath the sound file, we were able to bring the volume up and down at appropriate moments, making it fade to enable voices and sound effects to be heard. *Premiere* offers you more sound tracks than you could ever need, and you can use the in-built graphic equaliser, echo, and other filters to alter the effect.

We avoided putting too much incidental music in the film. There were a few points where we might have put in moody chords, or little incidental stings, but it's very easy to go over the top with such things. In the end, we opted to let most of the film go without music, and just keep it for where it was really needed.

In the final scene, we brought back the same music as was used in the opening, and this helped to tie everything in together. This worked particularly well to set the mood for the last shot in the film.

Compression solutions... cont'd



Export Movie Settings

Video Settings

Compressor: Cinepak Codec by Radius

Depth: Millions

Frame Size: 176 h 144 v ☐ 4:3 Aspect

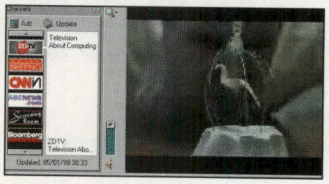
Frame Rate: 15

Quality: Low 100 % High

Data Rate: ☐ Limit data rate t

☐ Recompress

4 **We tried various settings on a resolution of 320x240, with mixed results. The clarity of the video was fine for some shots, but for others – particularly towards the end of the film – the compressor simply refused to use its full bandwidth (coming in at under 100K per second, rather than the 250K per second we asked for). The result was fuzzy, pixillated video. In the end, we raised the resolution to 360x270 and got a much clearer and sharper picture.**



5 **Reducing the data rate even more, we enter the realms of Internet video. Here, the major limitation is the speed of the user's modem. It's possible to render out an AVI or MOV movie and implant it into a Web page – but at Internet transfer rates, you won't get far.**

The solution is to use a program such as *RealVideo*. The quality won't be great, so if your video is short, and you don't need it to play live, it might be as well to let the visitor to your site download a compressed MOV file. That way you can be in control of the quality of your work, and the user doesn't have to visit your site every time they want to play the clip.

Getting it out there

Our movie was shot on S-VHS and digitised at about 1.2MB per second. The first step with the finished film was to render it from *Premiere* at the highest possible quality. There will be some loss of quality in the scenes where we've messed about with the video (by adding effects, filters, titles, transitions, and so on). However, if you render the project with the 'Recompress' option unchecked (and the compression codec and resolution are kept the same as those of the digitised footage), all other scenes will be rendered without loss of quality.

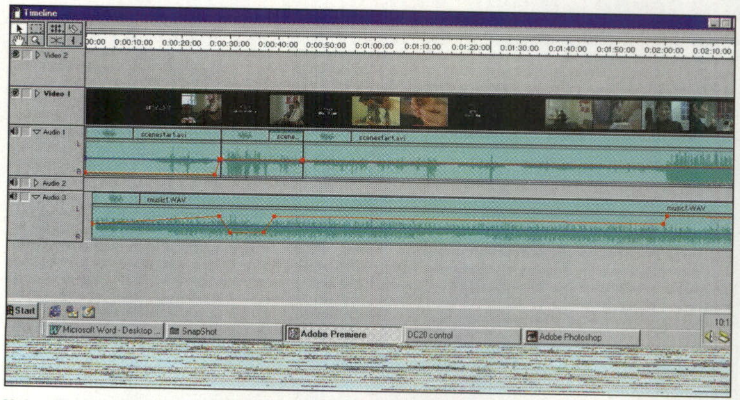
This rendering of the film is fine for outputting to VHS. However, the data-rate is far too high for the CD-ROM, and the compression codec is only recognised by computers fitted with the same Miro DC20 digitising board we're using. Thus, it's not much good for general release. For the CD-ROM, an even more compressed video had to be rendered.

Premiere makes it easy to test the quality of different rendering techniques, and you can get different results by playing around with the settings. See the Video compression solutions boxout for an in-depth look at rendering for CD-ROM, and check out our CD to see the final results.

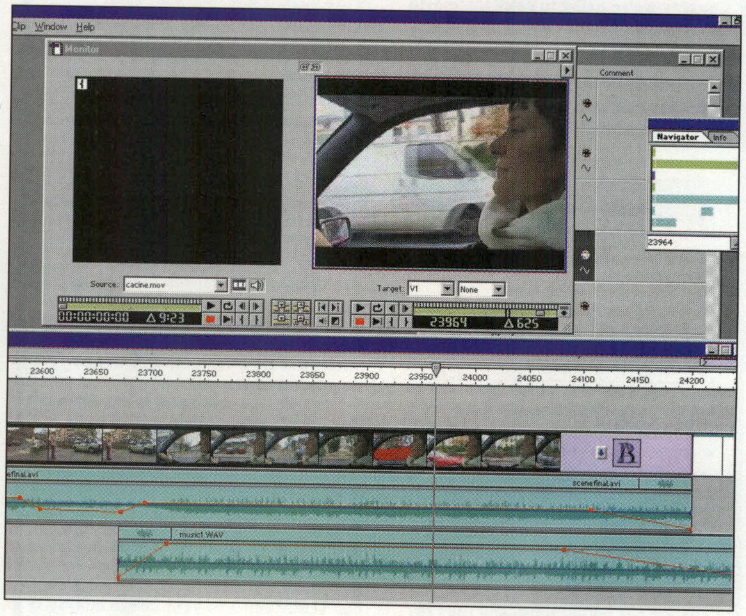
Et voilá!

And that's it – a complete film with all the post production work done on the desktop. The budget of the film was

> ***"Premiere makes it easy to test the quality of different rendering techniques, and you can get different results by playing around with the settings..."***



Using *Premiere* to add music to the film. The Rubber Band tool is used here to raise and lower the volume of the soundtrack to enable dialogue and effects to be heard.



low – we spent £20 on camcorder tapes, another £10 on CD-ROMs, and a little more on keeping the cast in chocolate throughout the shoot. If we had had to pay everyone involved, the cost would have been about £3000 (remember, we're only talking about actors and musicians here – all the rest of the names in the credits we invented for part three of this masterclass). If you need to buy the equipment and software as well, you would then be looking at an outlay of around £7000. Still, that compares quite well to the average BBC production where the standard budget for a cheap short film is £10,000-£30,000 – and £10,000 per minute is not uncommon for big dramas.

What you can't get around is the cost in time and energy. Whatever you tell yourself, and however you think you can work, making a film will consume all your energy, and take about twice as long as you plan for. However, if you've decided to go ahead with your film anyway, nothing anyone can say or do will stop you. And now you know how to do it, the world's your oyster. Just promise that you'll send *Computer Arts* complementary tickets for the premiere of your first blockbuster. **ca>s**

Information

You'll find the finished movie on the CD, along with a demo of Premiere 5. Expertise supplied by Christian Darkin at
e *christian@darkin.demon.co.uk*

Burning a CD-ROM

All you need now is a recordable CD-ROM drive with the appropriate software, and a little patience...

With the movie finished, all that remains is to burn it onto CD. We used the Yamaha CRW4260 and the *Easy CD Creator* software that comes with it, but most recorders now work in much the same way.

Prices for recordable CD-ROMS have dropped rapidly in the last year and they vary wildly (for example, we've seen the same brand ranging from 99p to £12.99).

1. First, assemble your files. It's far easier to create your directory structure on your hard drive than it is to try to design it as you put your CD together – that way you can be sure that everything's correct before you start burning the CD. It's even worth creating a separate hard disk partition of CD-ROM size (650Mb), so that you can create a dummy CD on your hard drive and test it thoroughly before you begin to record it.

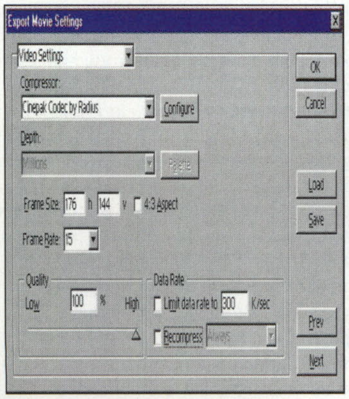
2. Load up *Easy CD* and select the files and folders you want to burn onto disk. There's an indicator at the bottom of the file selector to tell you how much space you've got left to fill. Depending on the audience you intend to aim your CD at, you have to consider which file system to use: Joliet – a system developed for Windows 95 which enables long file names; or ISO9660 – a standard which makes your disk readable on Windows, DOS and Mac computers.

3. Burn a test CD. If you can, use a re-writable disk (mistakes are easily made). And even if your CD-ROM is perfect, you'll almost certainly find that when you test it on a few other machines, it doesn't work as you intended. The most common problems with video productions are: the data rate of the video can't be supported by the CD so the video stutters; some of the machines you test it on don't have the video codec you need to play the film; the front end you've created to play the video can't find one or more of the files it needs to run; or the user can't figure out how to work the CD – despite the fact your design includes a button that says 'Press Here'...

4. It's now time to burn your final CD, get it to the duplicators, and wait for the praise, adulation and cash to come rolling in...

Streaming video from a Web page

It's now perfectly possible to broadcast your video productions over the Internet. Here's how...



Export Movie Settings

Video Settings

Compressor: Cinepak Codec by Radius

Depth: Millions

Frame Size: 176 h 144 v ☐ 4:3 Aspect

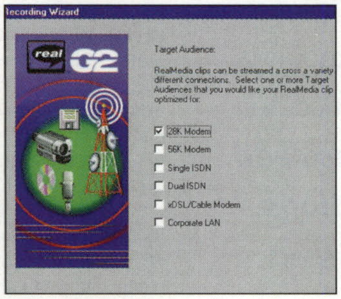
Frame Rate: 15

Quality: Low 100 % High

Data Rate: ☐ Limit data rate to 300 K/sec

☐ Recompress Always

1. Render the video at the resolution you're going to use for Internet broadcast. The codec isn't important here, but we unchecked *Premiere*'s Limit Data-rate To box, so the movie renders to the best quality it can for using the specified resolution. We chose 176x144 – it's the resolution recommended by most Internet video producers, and gives the best results.



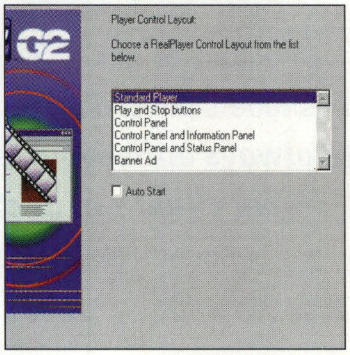
Recording Wizard

Target Audience:

RealMedia clips can be streamed a cross a variety different connections. Select one or more Target Audiences that you would like your RealMedia clip optimized for:

☑ 28K Modem
☐ 56K Modem
☐ Single ISDN
☐ Dual ISDN
☐ xDSL/Cable Modem
☐ Corporate LAN

2. Re-render the file in one of the Net standards for video. We're using *RealMedia*, because it's free, and most people have the RM plug-in on their browsers already. The *RealProducer* (download it at *w* www.real.com) guides you through the production with a pretty good wizard, which enables you to select your audience and select the file you want to compress. The software then goes ahead and makes your movie. *RealMedia* compression is quite amazing. The quality is pretty low, but with the entire 18-minute movie coming out at just over 2.5MB, you can't complain.



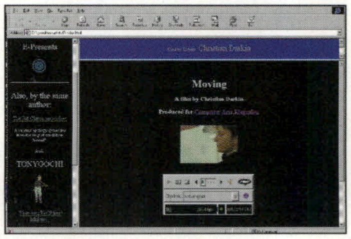
Player Control Layout:

Choose a RealPlayer Control Layout from the list below.

Standard Player
Play and Stop buttons
Control Panel
Control Panel and Information Panel
Control Panel and Status Panel
Banner Ad

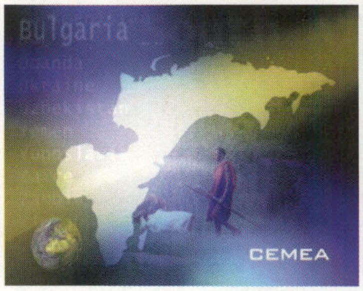
☐ Auto Start

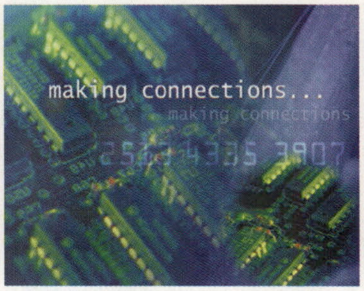
3. Build a Web page for the video. The new version (6.0) of *RealProducer* provides a wizard for embedding your video in a Web page – previous versions only included this in the commercial release. The wizard is straightforward, and enables you to choose how the video will be displayed and presented. We've used the page generated by *RealProducer* as a template, loading it into *PageMill* and tweaking it to fit in with our site.

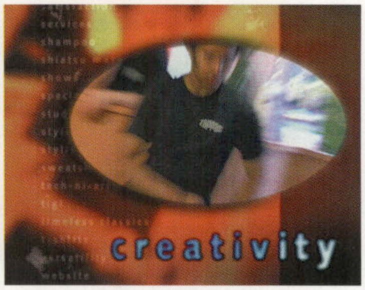


4. If you don't have your own Web server, you'll need somewhere to put your video. Most providers now give a portion of Web space to anyone with an account. However, these often come with provisos which means that if the film's 2.6MB in size and more than eight people want to watch the film in a day, the site will be suspended.

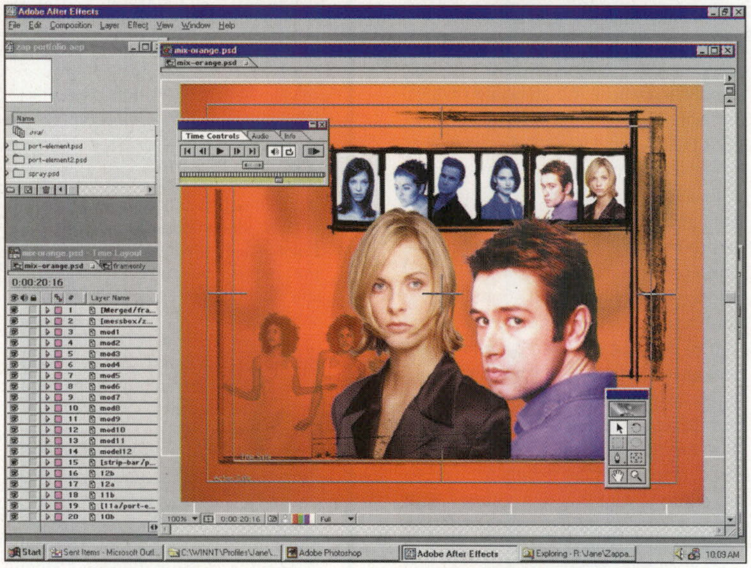
So, we've set up a free Geocities site (you can open one at *w* www.geocities.com). The process is simple – pick a 'neighbourhood', and move in – giving your e-mail address. You then get a password, which enables you to upload files to your new site.We've put the film at: *w* www.geocities.com/Hollywood/Bungalow/7623/index.html







These projects for Zappas, two Wokingham-based salons, and CEMEA, a large financial institution, were all filmed on Betacam SP, then processed in *After Effects*, a digital Betacam suite, and Avid. Both feature fairly minimal effects, in some cases including stock footage used imaginatively to create that most elusive of beasts – the interesting corporate video.



Mirashade

Director Baz McCarthy expounds Mirashade's philosophy for success: ***"We always endeavour to exceed out client's expectations."*** Sounds like a good start...

Mirashade was the brainchild of its two directors, Baz McCarthy and Simon Burgess. This lively video and animation house was founded on a real passion for the moving image and a desire to give clients a fresh approach – perfectly suited to a young, flexible company with the ambition to make its mark in design.

While it has branched out into print, multimedia and Web design, Mirashade's core business remains video production, state of the art computer animation and post-production effects. The company has shot in more than 20 countries around the world. Whether they're surrounded by bicycles in Thailand, hanging off the bumper of a speeding car in France or up the Empire State Building, Baz comments: "We always endeavour to exceed our client's expectations."

You need only look at some of Mirashade's corporate work for Ericsson, Andersen Consulting and the Future Centre in Chicago for proof of this. 3D and 2D graphics, multi-layered compositing and animation all feature heavily to produce something more akin to a slick TV ad than an in-house presentation. No surprise, then, that the company is also tackling ads for Visa International, among others.

Perhaps the most astonishing thing is that much of Mirashade's work is produced on standard desktop PCs, running a combination of *Photoshop*, *Illustrator*, *Director*, *3D Studio MAX* and *After Effects*. An Avid suite helps with off-line editing and the final edit is usually handled by a post-production house.

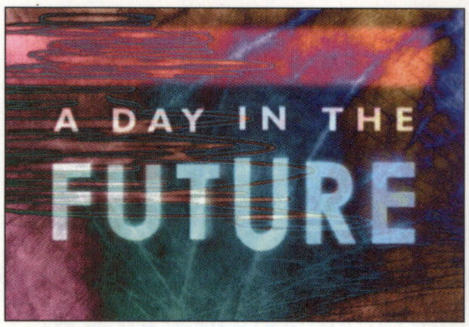
As Baz says, Mirashade is always striving to add something special – and the results speak for themselves. **ca>s**

Information

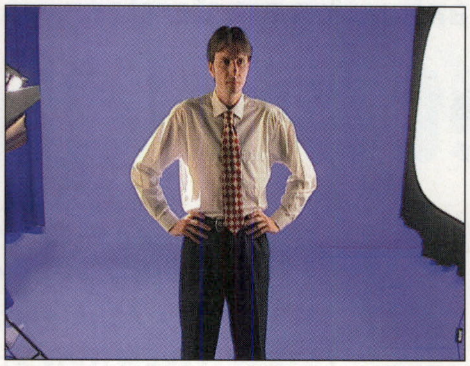
Interested? Find out more from Mirashade on **t** *0118 975 5255,* **f** *0118 975 5252, or point your browser at* **w** *www.mirashade.com.*

One: The Future Centre

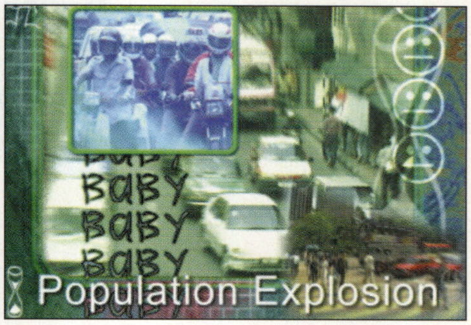
Andersen Consulting wanted to experience what their Chicago Future Centre would be like, before they decided to build it. Step in Mirashade with *MAX*, motion tracking and a whole load of existing CAD data...



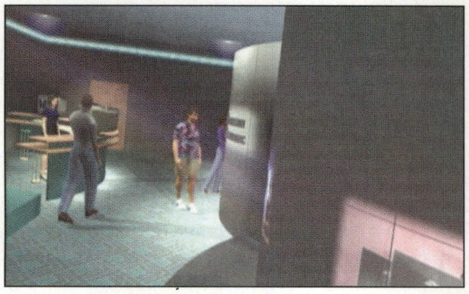
1 **The idea was to use the CAD data to create a 3D experience of the Future Centre, populate it with virtual people using motion tracking technology, and then create a video. But first, the title sequence. Photographs and drawings were scanned in and layered up in *Photoshop*. The layers were then animated in *After Effects* and re-edited using Avid.**



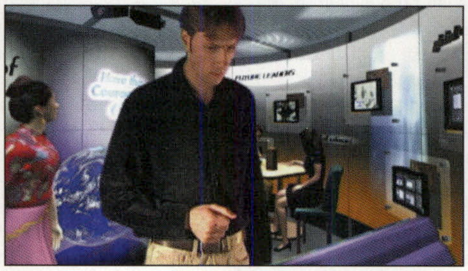
2 **The two main actors were shot against a blue screen in a Soho studio. The background was then removed in *After Effects* and a digital Betacam suite, enabling the figures to be placed seamlessly into a computer generated 3D environment.**



3 **For the 'population explosion' sequence, video footage of congested traffic and busy crowds was speeded up in *After Effects*, and then layered with graphic elements created in *Photoshop*. The resulting footage files were then imported into *3D Studio MAX* and projected on to walls within the virtual 3D environment.**



4 **Members of Mirashade acted out scenes in slinky black lycra cat suites covered in reflective balls, at a motion capture facility in London. The resulting motion capture data was processed for incorporation into *Character Studio* within *MAX*. This enabled life-like figures to populate the Future Centre and its surrounds.**

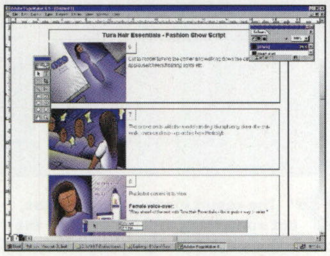


5 **Here the viewer is sited within the *3D Studio MAX* model of the Future Centre. The actor in the foreground was shot in a studio against a blue screen. *After Effects* was used to remove the background and create a matte to place the figure behind the screen in the foreground. Screens on the walls are playing live action and *After Effects* sequences. The figures in the background are animated using motion capture data.**

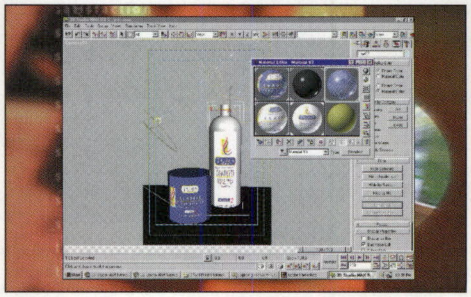
6 **The programme makes use of the flexibility afforded by digital technology to play around with narrative techniques. The narrator appears throughout the programme – sometimes in an everyday environment, having a drink with his friends, and sometimes he appears inside the Future Centre interacting with the 3D computer environment as though it were real. Here he narrates the action from screens created in *MAX* inside the Future Centre.**

Two: Tura Commercial

A range of software was used to complete this brief, to create a promo for the Tura range of products, including the Four Stage Relaxer System and the Styling Range. Mirashade had to make both 30 and 90-second versions...



1 **Hard work pre-prod is vital to the success of any project. One of the first steps is to draw up storyboards, which are approved by the client before any of the live action sequences are shot – in this case at Isleworth Studios in London. Here, quick sketches were scanned and coloured up in *Photoshop* before being imported into *PageMaker*.**



2 **Models of the products were recreated in *3D Studio MAX* for that super-real look.**

3 **Live action and 3D animation were combined with captions in a digital Betacam editing suite to complete the finished commercial.**

Digital animation masterclass: part one

Set building

FIRST THERE WAS *TOY STORY*, THEN *ANTZ* AND *A BUG'S LIFE* – COULD YOU DO BETTER? IN THE FIRST OF A FOUR-PART DIGITAL ANIMATION SERIES, WE TAKE A LOOK AT SET BUILDING...

You can create a top-quality computer animation on your humble desktop. Fact. And no, this isn't the hype from the 3D package designers, or the over-inflated claim of those predicting the end of the film industry – rather, it's something we're going to prove to you.

Over the next four parts, we'll be making the first five minutes of an animated film, using *3D Studio MAX* and its various plug-ins. With it, we're going to design the sets and the characters, create the animation, and produce the final movie clip. And when it's finished, it'll be used as a showreel, and taken around to various broadcasters and film funding bodies to try to secure funding to make the full length movie. Now that's confidence for you. Ready to embark on your animation journey?

The story for this blockbuster is one you may already know. In fact, the script was written by little-known wordster William Shakespeare – *The Tempest*. Shakespeare offers a great deal to low-budget filmmakers (and indeed any sort of filmmaker): his work is high quality, it's written very tightly, and all the action takes place in just a few locations. More importantly, the writer has been dead since the early 1600s, so he can't complain about your treatment of his work, and you don't have to pay him royalties!

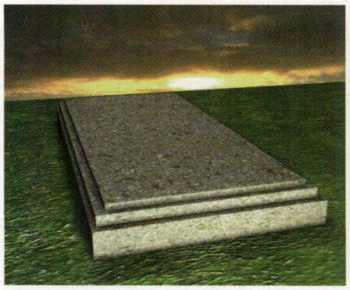
In a galaxy far, far away...

This issue, we're going to get to work designing the sets for the movie – only this version of *The Tempest* is going to be shot sci-fi style, so purists beware. The opening scene is pure Hollywood – a starship transporting a group of powerful politicians is caught in a meteor storm, and its complement of drunken sailors fight incompetently to save the vessel. Meanwhile, in an abandoned settlement on a nearby planet, the mysterious Prospero instructs an ancient computer – the machine is controlling the storm... (and that's just the beginning).

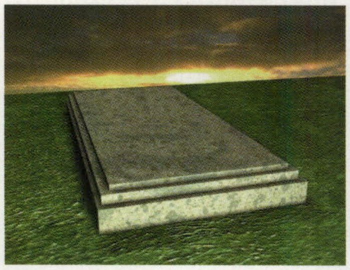
> *"Even if your work is pure fantasy, it's going to need some roots in reality to be convincing... then your imagination can go into overdrive"*

Multiple maps: the floor of the ruin

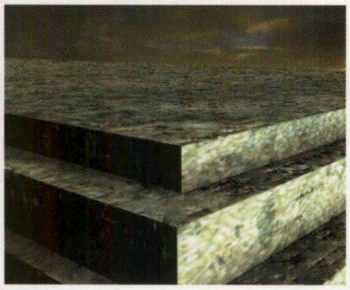
The floor of the ruin could have been simple (as it's very worn stone) – but we wanted an authentic look. The material we constructed uses several maps to create the bumps on the surface, plus a complex pattern of colour. Check the CD for more



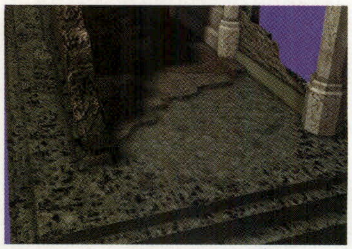
1 The floor of the ruin is simply an old stone that's been worn away by time. The material we ended up constructing uses several maps to create the bumps on the surface, and a complex pattern of colour.



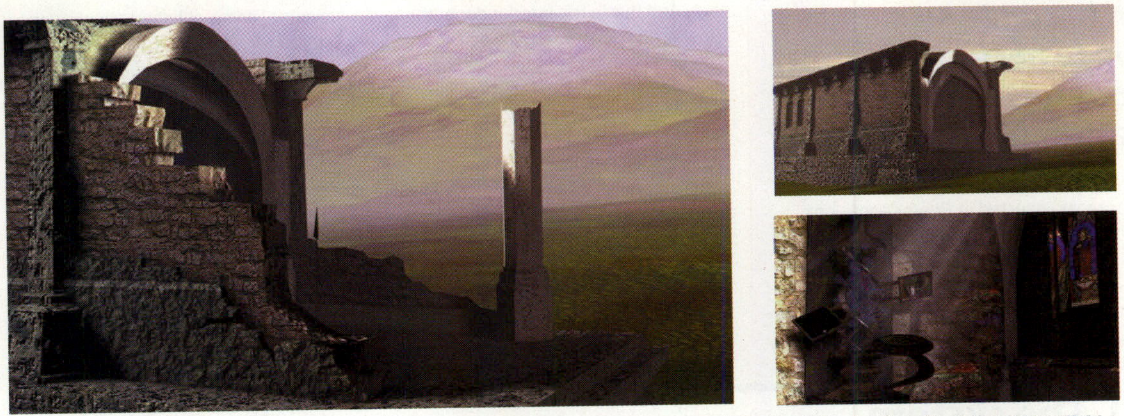
2 Begin with the 'Stone Aggregate' material from the *MAX* library. We kept the material's original bitmap colouring as one map, but added a second 'splat' map to it. This covered the material with randomly shaped spots, as though lichen was growing on the walls.



3 So far, so good – but the material needs roughening up. Use two bump maps: the original 'Stone Aggregate' colour image to make fine imperfections in the stone; and for some serious ageing, a 'dent' map with a high setting.



4 The result looks quite realistic, but something still isn't right – the foundations are equally worn inside and outside the building. This would never happen in reality, so you need to create a third map (a radial gradient map), and use this to smooth the interior and roughen the exterior stone.



(clockwise from top right) In order to create a ruin, it's sometimes a good idea to build the complete structure first. A projector light placed just inside the window provides the interesting lighting. A good use of lighting can be used to great effect – here, we've created a suitable atmosphere doing just that. See the main copy, and the boxout 'Flaring Up' on page 81.

The Tempest has everything: action, adventure, romance, and of course, implausibly difficult animation sequences. Clearly, we need two sets: the ship, with its attendant storm; and Prospero's den – a ruined building.

The starship

So, let's start with the starship. The first step is picture research. Whatever you're designing, try to get hold of some images of similar objects to work from. Even if your work is pure fantasy (as in this case), it's going to need some roots in reality to be convincing. Once you start researching images, you'll find that your imagination goes into overdrive and soon you'll have more than enough ideas.

The starship we had in mind to create was a little surreal – we wanted it to invoke the feeling of an old square rigger. For our initial attempt, we sat down and designed it without doing any research at all. It looked okay, but it didn't really put across anything more than the fact that it was a spaceship.

As this is the first image the viewer will have of the film, it needs to do far more than that: the ship needs to say something about the society that has created it, the mission it was on, and the whole atmosphere of the film (we've come up with a whole backstory for this film). After searching the Internet for reference pictures of ships (we used **w** www.altavista.com), we started the ship again from scratch. It took a little longer this time – about a week of solid work, but the results are far more interesting.

Attention to detail

In designing this ship, you need to begin by creating the detail. First, build several simple shapes to scatter around the finished vessel – the lanterns and pulleys, ropes and chains. Most are pretty simple constructions – either lathe or extrude them from lines, and then tweak them at the sub-object level. One of *MAX's* most useful tools is the Mesh Smooth option. If you create a very simple representation of whatever you're trying to build, you can then apply the Mesh Smooth modifier, plus another Edit Mesh Modifier to put in the detail.

A handy tip to remember here is that by the time you've finished creating a complex scene, you usually end up with several texture and bump maps spread over your disks. You'll have built some of these for the project, and you may use some in other scenes as well. What's needed here is a bit of order.

As luck would have it, there's a free plug-in (Collect.zip) by Andrey Zmievski which you can get at **w** www.3dcafe.com (one of the best sites for 3D info and downloads). This clever add-on appears in *MAX's* Utilities panel, enabling you to collect all the bitmaps involved in your scene, move them to a specified directory, and update your materials accordingly – saving much time and effort.

The ruin

Here, the intention is to create a ruined building in a rolling landscape. However, to create a ruin, it's sometimes best to start by creating a new building, and then pull it down.

A worthwhile tip here is to think like an architect rather than an artist. Don't ask yourself what would look most convincing, or where the best place for a pillar would be. Ask yourself how the building is supported, what parts of it are structural, what parts are decorative and how it's been used. That way, not only can you put up a more convincing construction, it'll also be easier to ruin because you'll know what ought to happen when you remove the supports.

Hard hats on...

Construction begins with a pillar – a simple line, lathed with eight faces, and duplicated four times in a square. We want the building to have a church-like feel to it, and the pillars need to form the internal support for the structure. Picture research turned up a rather interesting image, in which rows of pillars supported arches connecting the whole building together, holding up the ceiling too.

First off, you need to construct a simple lofted arch which links one pillar to the next, and then copy that six times: four to link the pillars in a square, and two stretched versions to join the diagonal pillars. From here, you want to extend the structure with more pillars, using NURBS surfaces to fill in the curved ceiling between the arches. The result is similar to a Victorian summerhouse.

Interior design

Next come the walls – plain rectangles to start with, joining the pillars. You can make these out of concrete, and create crumbling frescos as colour maps (the frescos are old masters with ⇒

> *"Think like an architect rather than an artist. Don't ask yourself what would look most convincing... ask yourself how the building is supported and what parts are structural"*

> *"It might seem too much to create so many layers, but once we begin to hack away parts of the building, the various layers will be exposed, creating interest & adding realism"*

⇒ cracks inserted in *Photoshop* – look closely and you'll see there's a Homer up there on one wall). Finally, you need to create another layer of wall at the bottom – a ledge all the way around the building – and a skirting board below that. And that's the interior done: the plaster and decoration.

For the outside of the building, you then need to construct a whole new layer of wall using aged brick, and another ledge made from some kind of algae-encrusted stone.

First, build a set of simpler, more sturdy and less fancy-looking pillars to support the structure of the building. It might seem a little too much to create so many layers for such a simple building (even the flooring has three layers – a foundation stone, a concrete covering, and a polished tile on top), but it's well worth it. Once we begin to hack away parts of the building, the various layers will be exposed, creating interest and so adding realism.

Then, to further aid the whole atmosphere of the place, you can put in a lens flare for the sun, plus some fog to make the mountains recede into the background.

The final step to consider is the lighting. For the interior, you need to shut out the light from outside, and then re-light the inside entirely, to

The system

3D animation of this complexity is about the most everything-intensive task you can get a machine to do. So, what exactly do you need?

Well, this kind of work demands the fastest processor, the most memory, the biggest screen, the best graphics card, and the largest, fastest hard disk you can afford. If you're thinking of setting up a system, here's a rundown of the computer our animation is being produced on.

Basic System:
Pentium Pro 330 (overclocked) chip
128MB RAM
6GB Eide HD (Maxtor)

Display:
Samsung SyncMaster 1000s 21-inch monitor. If you want to create complex 3D animations, you need to work at high resolution and that means a large, high quality monitor is essential. We're working at 1280x1024 resolution.

Graphics card:
Creative Graphics Blaster Riva TNT. Using a quality 3D card (it compares well with pro cards at ten times the price), the whole process becomes smoother and faster, as you're not limited to working in wireframe or bounding box mode on complex projects.

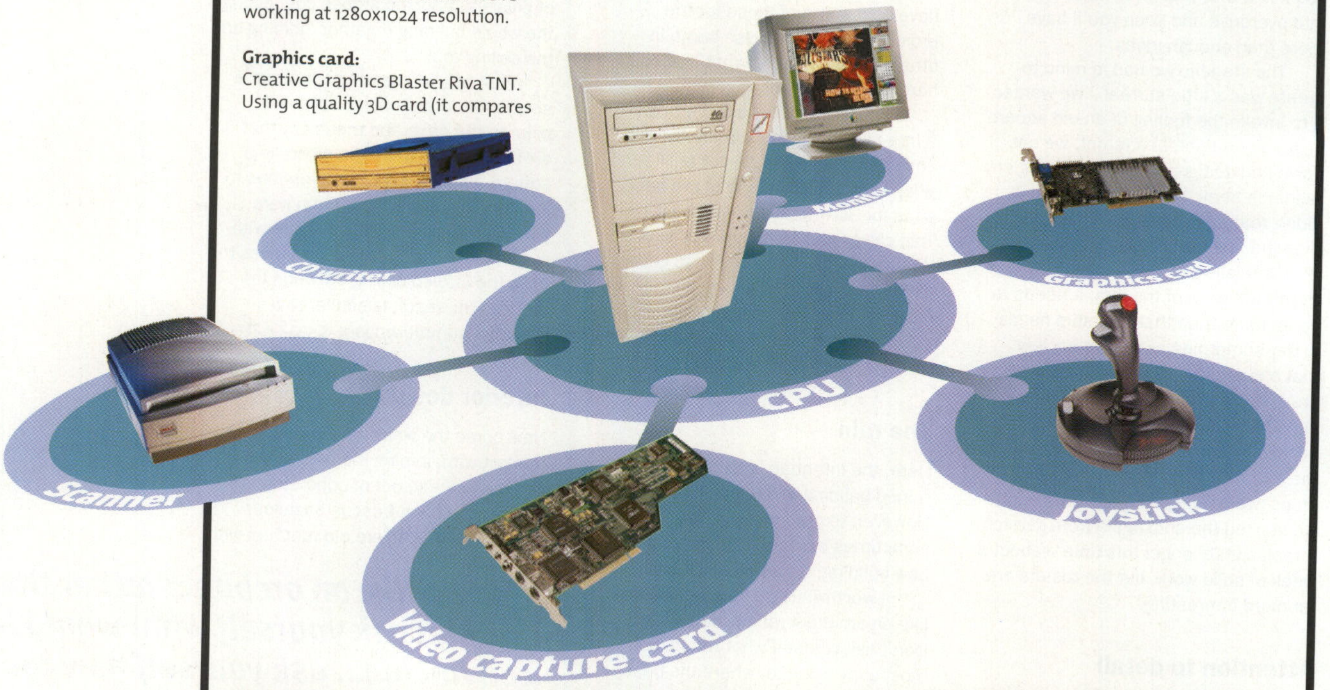
Video capture card:
AV Master 2000 video card. If you want to output your work to video, you'll need some kind of TV out. Most video digitising cards provide this, as do a few of the most modern graphics adaptors.

Useful extras

Scanner:
Epson GT5000. If you can get a better texture using a scanner, do so – you'll often add more realism.

CD Recorder
Yamaha 2460. 3D animation work calls for a great deal of memory, and so it makes sense to have a way of backing up your files and keeping old projects without cluttering up your hard disk. A CD writer is about the most cost-effective way you can do this.

Joystick
Gravis Blackhawk Digital. *3D Studio MAX* enables you to assign almost any aspect of your scene that you can animate to the movement of a joystick or mouse. You can then record your animation in real-time, giving a quick way of producing natural motions. It's one of the most underused and flexible functions of *3DS MAX*.



Flaring up

Mastering the lens flare function can really boost your scene...

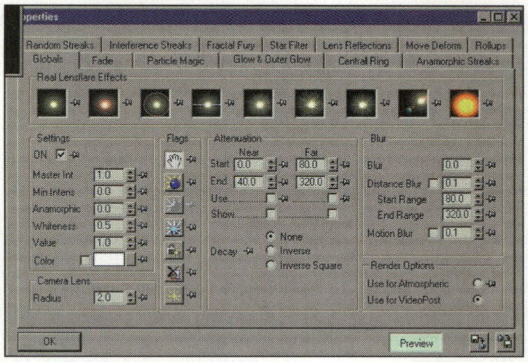
There are a few things you can do to lift your scene – and one of the most instant and impressive is the lens flare. In real life, lens flares are what happens when bright lights reflect off tiny imperfections on the camera lens. Camera operators spend almost as much of their working day trying to avoid lens flare as 3D animators spend artificially putting it in. Working with a digital scene, there's no camera lens, no imperfections, and hence no naturally occurring lens flare. However, if it's inserted artificially, it can create some stunning and realistic effects, and bring life to an otherwise average scene.

MAX has a built-in lens flare generator – you'll find it in the Video Post menu. You can assign it to any light or object, it's fully animatable, and you can alter it to do many interesting effects. It's useful, but inconvenient to use: the update speed when you alter your flare is quite slow. Plus, it's stuck away in Video Post, where you can't easily test it out. What's more, the relative size of the flare changes with different rendering resolutions, so you can't test it at low-res.

So, we decided to use the Cebas plug-in *ProOpticSuite* (**w** www.cebas.com). This generates a wide range of lens flares and enables you to place them into your 3D scene as objects, then render them with the rest of your work.

There's a massive selection of variables to alter everything about your lens flare, right from its size and glow, to the number and colour of the refracted after-images it strews across your image. You can create your flare from scratch, but it's best to just alter one of the stock effects supplied with the plug-in to your own needs.

ProOpticSuite also includes plug-ins for creating focus effects, luminous objects, plus realistic fire and smoke. We'll be taking advantage of some of these later in our production.



Settings
ON ☑
Master Int 1.0
Min Intens 0.0
Anamorphic 0.0
Whiteness 0.5
Value 1.0
Color ☐

Camera Lens
Radius 2.0

Attenuation
Near / Far
Start 0.0 / 80.0
End 40.0 / 320.0
Use ☐ / ☐
Show ☐ / ☐
Decay ● None ○ Inverse ○ Inverse Square

Blur
Blur 0.0
Distance Blur ☐ 0.1
Start Range 80.0
End Range 320.0
Motion Blur ☐ 0.1

Render Options
Use for Atmospheric ○
Use for VideoPost ●

produce the required effect. To aid this process, create a volume light from the ceiling, and shine it through a wireframe sphere (hung just out of sight). This creates streaks of light, as though the sun was shining through a broken roof – just like those 'Easy Like Sunday Morning' 1980s coffee ads...

Projected image

For the final part of our lighting project, it's now time to shine target spots from the windows, using them as projectors. Give the projectors the image of the stained glass window, so that the image of the window is also streaked across the back wall. The next step is to fill in with a strong light from the other end of the building through the broken brickwork, bleaching out parts of the image at random. The result is that there's plenty of interesting light in the shot, but the effect is still mysterious, since parts of the scene are in shadow.

Overall, there's a lot left to the imagination – always important.

With the sets completed, we can now begin to populate them – but not just yet. In the next part we'll build our *Tempest* characters, bringing to light more of *MAX's* trickery. **ca-s**

> ***"There are a few things you can do to lift your scene – and one of the most instant and impressive is the lens flare feature..."***

Information

Expertise supplied by Christian Darkin on
e *christian@darkin.demon.co.uk*

Tools of destruction

A classic problem with 3D modelling is that it tends to produce images which are too clean, sharp and clinical for real life. Putting grime, age and roughness onto models is a tough job. Here are a few possible methods...

DirtyReyes

This is a plug-in for *3DS MAX*. Things get dirty – it's a fact of life. *DirtyReyes* is a simple idea – it scans your model looking for places where dirt would collect, and constructs an image map darkening those areas, as though the model has been covered with an uneven layer of dirt.

DirtyReyes is also easy to use, with just a couple of buttons. However, even basic models can take a long time to process, and if you can create the effect yourself (perhaps with a 3D paint program), you might well be better off.

The cookie cutter

We used this extensively, especially on the flooring and walls of the ruin. The process is simple: use the Create Spline tool to draw a rough and jagged line. Join the end of the spline to its start by means of a large diversion (so you get a big shape with one jagged edge). Extrude the shape, and subtract it from your wall using a Boolean: the result is a roughly broken wall. You can then experiment with different shapes for your cutter – we used a very jagged cutter for the plaster on the walls (because it's soft and crumbly).

However, we used a lot of straight lines for the brickwork, which we drew to follow the pattern of the brick. (You'll need to work with your Viewport set to Show Textures to achieve this.)

The rubble scatter

This is something we experimented with, but didn't eventually use. The idea is to use a particle system, along with various deflectors, plus wind and gravity effects to randomly drop pieces of dirt and rubble around the floor of the structure. The result ought to be groupings of whatever you're scattering, which collect in the corners and the crevices within your model.

The grime map

This refers to creating an image map with dark and light patches plus marks, then mixing it with your diffuse map on the image. This can create a pretty convincing dirty texture. Use an airbrush tool in your paint program to simulate stains and patches of grime. Alternatively, use a smoke or noise map to generate the effect randomly in *3DS MAX*.

Digital animation masterclass: part two

Creating characters

ALL THE WORLD'S A STAGE, AND ALL THE MEN AND WOMEN MERELY... CREATED USING *3D STUDIO MAX* AND A TOUCH OF DIGITAL ANIMATION KNOW-HOW. ARE YOU READY FOR THE CHALLENGE?

Were you paying attention over the last four pages? If so, you'll know we started an ambitious animation project to produce a five-minute clip from a proposed film of Shakespeare's *The Tempest*. If you haven't read it yet, you might want to head back to page 78 to check out what we've done so far.

In this four-part series, looking at different aspects of the model-making, animation and post-production of a short movie. In the first part, we built the sets and looked at the way materials, models and lighting work to produce an atmospheric scene. Now it's time to produce the characters that are going to populate our virtual world.

Creating expressive and believable characters is probably the hardest thing you can do in 3D animation. The appearance of the human face is so familiar to us that we can recognise one person from another instantly – even though facial features often differ between individuals by only a few millimetres here and there.

This creates two separate considerations for the 3D designer. The first is that building a humanoid model – especially the face – has to be done very carefully. The slightest deviation from realistic proportions and features is very obvious.

The second consideration is that if, as in this case, you're producing humanoids (not human characters), the differences between individuals have to be more pronounced. This is because our eyes are only used to human faces: the facial features of a goldfish, for example, differ as much as those of humans – but you'd have to know a goldfish very well before you could tell it from its twin.

The upshot is that you have to tread a fine line between creating characters which are too similar to yourself, looking like badly constructed humans, and those which are too different for viewers to tell them apart or understand their expressions.

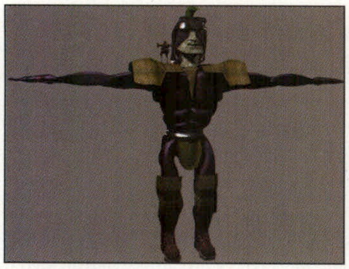
> *"Creating expressive and believable characters is probably the hardest thing you can do in 3D animation..."*

Body parts

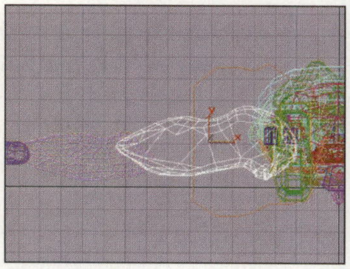
In most cases, the body of an organic creature is too complex to be built from one primitive (most of our characters come in at around 40-45,000 polygons). It's possible, of course. There are designers who swear by the technique of beginning with a simple

A mesh character

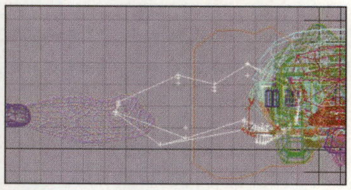
For the first character – Gonzalo, the king's bodyguard – we opted to use the most basic of construction tools. Working from very simple primitives, we refined the body parts and edited each vertex until they were correct...



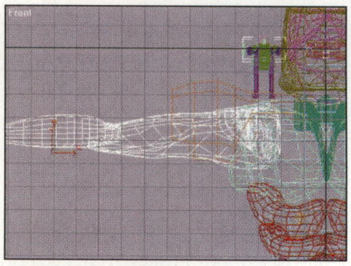
1 Each body part began as a simple shape – either a box, or a closed line extruded to form a solid object. We then added an Edit Mesh modifier, and the vertices were dragged around to create a rough approximation of the shape required.



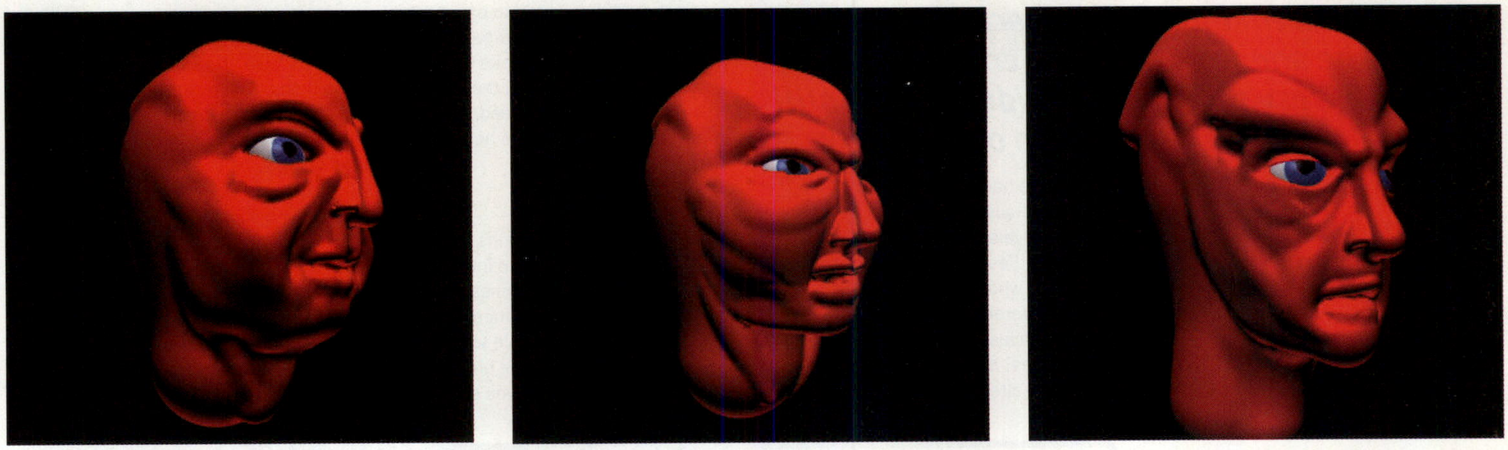
2 Next, we applied a Mesh Smooth modifier. This modifier creates extra vertices to build a smoother, more organic looking shape from the original primitive. (For a more flexible smoothing operation, you can use third-party plug-in *SurfReyes* instead of Mesh Smooth.)



3 Going back to the Edit Mesh modifier, you can now fine-tune the original shape for exactly the right contours. This can be quite time consuming, as you have to continually adjust the mesh, then return to the top of the modifier stack to see the result of your manipulations. For finer adjustments, you can add an Edit Mesh at the top of the stack so that you can move the vertices in the smoothed mesh.



4 When all the elements of the model have been constructed, you can fuse them together using the Create Boolean tab, adding all the body parts together as one model. Beware, though: in older versions of *MAX*, the Boolean operations are notoriously moody.



Using the same basic *MetaReyes* model (and tweaking the position of certain muscles), we created a range of different characters.

box, then extruding faces to form arms and legs, and slowly refining them by selective mesh smoothing until the required result is achieved. Others use 'patch modelling', creating faces and vertices of the model one at a time, and building up the shape in that way.

However, most designers find it easier to build limbs, torsos, heads, hands and other body parts as completely separate models. You can then scale, position and attach them to each other, when all the detailed design work is done.

If you're using Metaballs to model the figure, attaching is relatively straightforward. Limbs should meld together naturally. However, as with any other form of model, try to avoid obvious seams between body parts. Optimising and smoothing often helps in these areas, but sometimes joins can become such a mess that the only option is to cover them with some item of clothing or jewellery.

We used photos loaded into *MAX's* viewport backgrounds to help with the initial design of our characters' faces. Books on anatomy are helpful too, providing images of the way the body's muscles are arranged beneath the skin. In addition, we drew on animal faces for some of the characters. The sailors, for example, are (very) loosely modelled on the faces of dolphins. We wanted them to appear friendly and slightly comical, so created large eyes, a smiling mouth and a blueish skin.

Family resemblance

We built the main characters using the *MetaReyes MAX* plug-in. They're all descended from the ruling classes, and the play deals chiefly with two families. We wanted to create a resemblance between individuals, even though everyone had their own distinct character. So we modelled each face (and body) from the same basic *MetaReyes* model, but altered each slightly. A little tweaking of the muscles in the face and the shape of the body creates a series of very different individuals, but still keeps an overall look which defines the species and family from the other characters.

This worked fine until we came to Miranda, Prospero's daughter – the female lead. She's supposed to be young and beautiful, but we wanted to retain a family resemblance by modelling her on the same muscle framework as her father.

Everybody knows the difference between an elderly man and a young woman. However, when you come to analyse what that difference amounts to and re-create it on the screen, life

⇨

> ***"Just a slight reddening of the cheeks or a darkening of the eyes or lips can give a subtle variation which brings a face to life..."***

The software

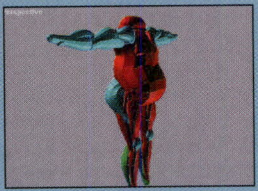
A wide range of plug-ins are available to extend *3D Studio MAX*'s functionality. Here, we're using the four listed below, plus *Painter 3D* – a handy tool for painting your models, though something of an extravagance...

Software

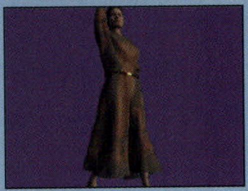
3D Studio MAX
The world's best-selling 3D modeller and renderer – expensive but desirable.

Plug-ins and compatible software

Character Studio
For animating Bipeds. Also includes Physique for creating & animating character skins.



MetaReyes
A plug-in used for Metaball modelling – a great technique for creating organic shapes.



ClothReyes
An plug-in used to animate clothes, which produces astonishing results.

Painter 3D
An application for creating 3D textures and bump maps directly on a 3D object.

> *“A little tweaking of the muscles in the face and the shape of the body creates a series of very different individuals – but still preserves an overall look...”*

⇒ gets a little harder. Strip away the surface details – skin colouring, hair, wrinkles, eyelashes and the body shape (all these things will be added later), and what are you left with? Minute differences in the smoothness of the muscles, the shape of the cheekbones, and the size of the eyes – things can alter a face completely.

In the end, we opted to expand the eyes and raise the eyebrows, smooth out the whole face and make the nose smaller. We then filled out the lips a little and raised the forehead. We also made the entire face more aquiline.

Bring it to life

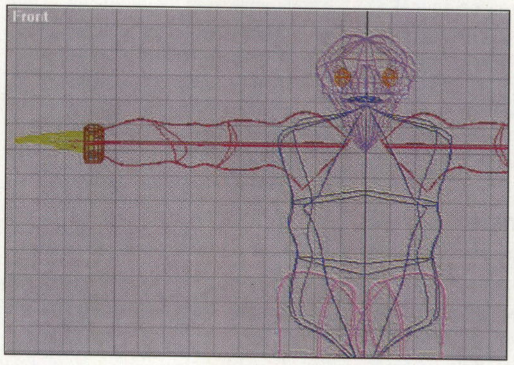
So, we've modelled the skins – what's next? Well, it's now time to introduce the subtle shading, skin tones and textures which help bring them to life.

To do this, it's possible to get away without a 3D painting program when creating textures – you can use something like *Photoshop* to position textures on a map and blend them. In this case, it's easiest to use planar mapping. Before you begin, a good tip is to render an image of your model in white from the direction your mapping is going to be done. This image then serves as a guide when you attempt to line up your markings and textures.

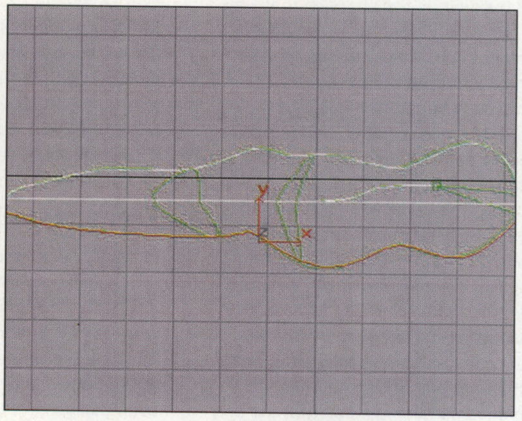
This method is by no means ideal, and some kind of 3D painting is almost essential for complex projects. We're using *Painter 3D* which offers a number of natural looking painting techniques, and enables you to draw directly onto your 3D model – either

A NURBS character

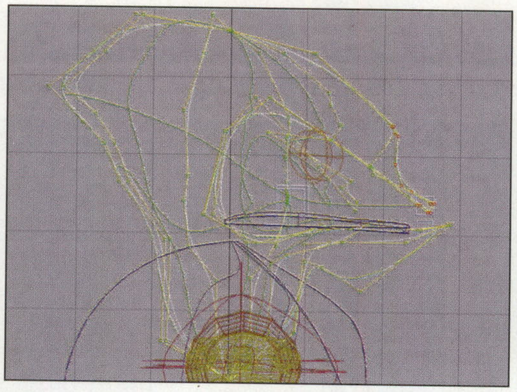
For the drunken sailors, we opted to use NURBS as our construction tool. NURBS provide a method of producing smoothly rounded shapes, without the need to mess around with thousands of vertices. Can't complain, huh?



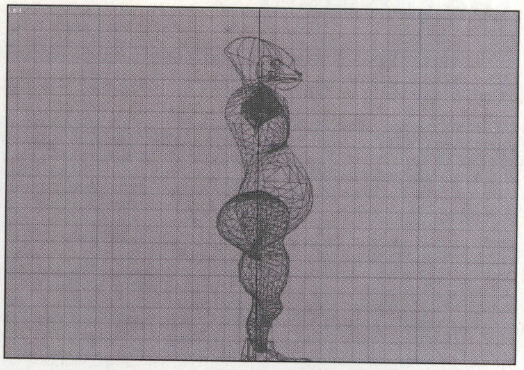
1 **NURBS objects begin as simple lines. You draw a number of NURBS lines at different positions and angles to define the cross-sections of your object. Because NURBS objects are quite demanding of system resources, and because most natural objects are broadly symmetrical, we opted to produce most of the body parts as half-objects, which we could then mirror and fuse together.**



2 **Next, NURBS lines are collapsed into NURBS surfaces. You then need to construct planes with the Loft option to join the lines into a workable shape. Here's where you first begin to see the object you're creating.**



3 **Go to the sub-object level, then grab and drag the individual control points for each of the NURBS lines. By doing this, you can refine your shape until it's perfect. This can get quite messy when you're dealing with a complex shape like this head.**



4 **It would have been possible to do all the animation work with the model as a NURBS object (or a group of them). However, because characters are complex enough to animate, we decided to collapse the figure into a mesh and *then* add the body parts together, before starting work on the animation.**

as an image map or a bump map. It's remarkably easy to put together the kind of variations of colour found in skin, or spray on imperfections in clothing colouration. A slight reddening of the cheeks, or darkening of eyes or lips gives a subtle variation which brings a face to life. A few wrinkles and lines can further add character.

Dedicated follower...

Clothes are the next problem. You might think that designing a characters' body and then covering it up with clothes is a bit pointless. You may end up deleting large parts of the body because it won't be seen – but here, we used a copy of the body mesh as the starting point for the clothes. For instance, you make a shirt by taking the torso and arms of the character, and then use a cookie cutter to create head and arm holes, adding modifiers to the result.

Another example is the king's coat, which is based on his body shape, but with adjustments and trimmings. Here, we've used Boolean subtract with a wedge-shaped object to make a hole for the head and the open front of the jacket. We then used the Relax modifier to soften muscle definition and give a suggestion of the body shape, rather than an exact copy of it. After that, you need to edit the mesh to put the finishing touches to it, and draw the trimmings on as a visible spline which you trace around the edges of the jacket by hand.

Building the clothes is one thing: but animating them is quite different. Later in this issue, we'll be using *ClothReyes* – a plug-in for realistic cloth movement. However, because *ClothReyes* requires an extra layer of calculation to be made (and this takes a long time on complex models), we're restricting it to one character. The rest are clothed in less flexible garments which move in the same way as their owners' bodies. This can look artificial, but choose your angles and have a detailed enough mesh so the clothes bend, and nobody need be any wiser.

> *"You make a shirt by taking the torso and arms of the character, and then use a cookie cutter to create head and arm holes, adding modifiers to the result..."*

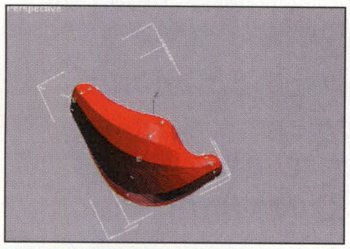
Over the next few pages, we'll look more at *ClothReyes*, and get to work with movement and facial expressions, as we begin to animate the film.

Information

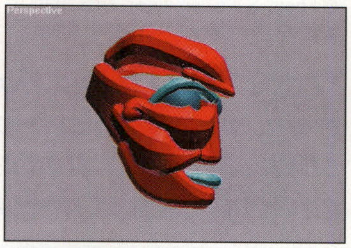
Expertise supplied by Christian Darkin on
e christian@darkin.demon.co.uk

A metaballs character

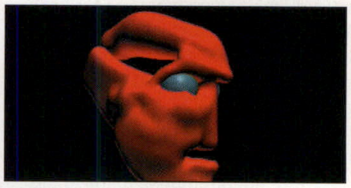
Metaballs are probably the best tool available for creating complex organic creatures. Put simply, they enable you to construct a model from a series of simple muscles which meld together into a sophisticated shape. Metaballs are not a standard part of *MAX*, so we're using the *MetaReyes* plug-in for the job...



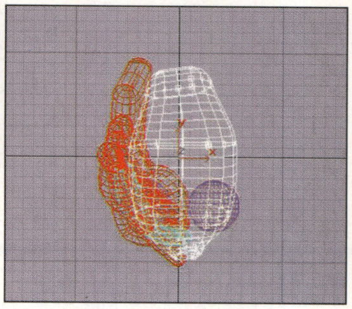
1 You create muscles by defining a series of cross-sections. Each is an ovoid where you can define the radius of each end – the length of the oval – plus its angle and position. It's possible to alter these cross-sections later – so you can be quite careless at the initial design stage, and refine your work later.



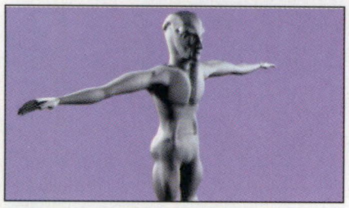
2 Once you've got two or more muscles, you can use the sub-object editing options to begin building the shape of your figure. Start with the largest muscles, then progress to the more detailed ones once you've got the basic shape. A book on anatomy can often help here.



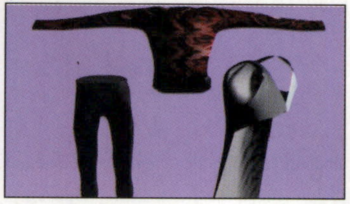
3 Our character is beginning to take shape, so it's time to see what it's going to look like. Selecting and creating a muscle group makes all the muscles within that group fuse together. This doesn't show up until you render your model. If the model looks too rough, it's likely that you've got the mesh setting too low – higher mesh settings produce more polygons in the render, and thus muscles are better defined.



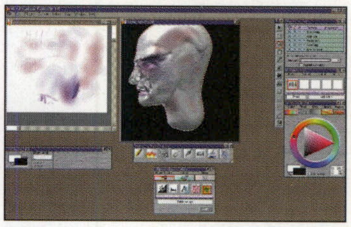
4 Once you've grouped your muscles, you can fine-tune your model: moving and resizing the muscles at sub-object level, then rendering to see the effect on the finished character.



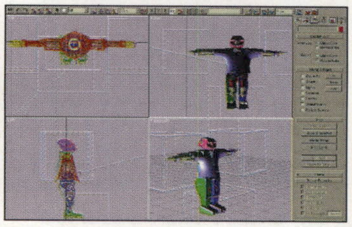
5 With the character finished, you can now convert it to a mesh for animation. We made our characters from six separate metaball models, the head, the body, the feet and the hands. By using metaballs, you're able to construct several characters of the same species from the one basic form, altering the muscles to create different facial features and body shapes.



6 Next, the character needs to be clothed – but building clothes is a tricky job. We found that the easiest way was to copy the body mesh, slice off the hands and legs, and then create holes in appropriate places (by building rough objects and using Boolean Subtract). We then applied Relax, Mesh Smooth, and Edit Mesh modifiers to produce realistic shapes. Now remove the original bodies.



7 With the geometry completed, the next step is to paint the characters. We used *Painter 3D*, and imported each object separately to create image and bump maps. Just a few strokes, shading parts of the face, reddening cheeks, darkening lips and filling in wrinkles around the eyes can turn a model into a believable character.



8 Finally, in order to be animated, the character needs to have a structure of bones. We're using the *Character Studio* plug-in from Discreet. This is a system for animating bipeds. By creating a biped of the right dimensions, and applying *Character Studio's* Physique modifier, the skin and clothes are moved, along with the biped figure.

Digital animation masterclass: part three

The Tempest comes to life

PUTTING A DIFFERENT INTERPRETATION ON ONE OF SHAKESPEARE'S STORMIER CREATIONS, WE CAN NOW START TO ANIMATE OUR STORY...

All the modelling for our 3D, animated sci-fi version of *The Tempest* is now complete. We've designed sets, moulded characters from metaballs and NURBS, and constructed clothing. We've also painted and textured the world in which our story takes place, with stonework, grass, skin tones and fabric patterns. Now we're going to start animating our story, once again using *3D Studio MAX*.

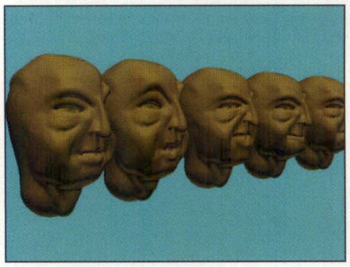
We're not attempting to make the whole film, just the first five minutes with two scenes. The first is aboard a ship battling through a meteor storm. The second is set in a ruined building on the planet below, from which Prospero is controlling the storm with the help of his computer, Ariel. This was always going to be tricky: there's a lot of action and interaction in the meteor storm scene, and we'll also need a lot of character animation.

Before you attempt any animation, use a Hide function to clear everything in your scene that doesn't relate directly to the animation. A complex

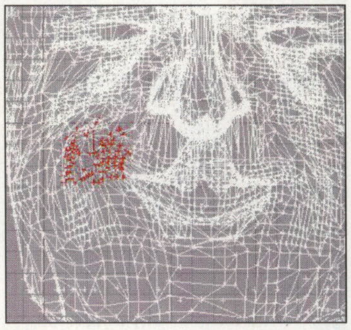
> ***"Look at the latest Hollywood offerings, even, and you'll see moments where the physical interaction between characters and objects just doesn't look right..."***

Talking morphs

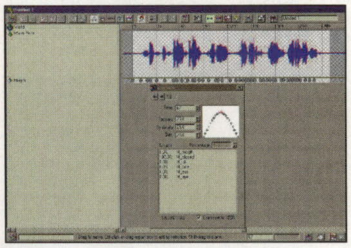
It's one thing to design a character, but it's another to get it talking. Here's how to get it chattering...



1 Create several copies of your character's head – one for each mouth shape or expression you need, plus one extra for the basic morph mesh. Give each a descriptive name, say 'oh', 'aye', 'smile' and so on. The number and type of movements you opt for depends on your character; for a talking bird you could settle for just 'open' and 'closed' morphs, but for a human you might consider using ten.



2 Alter each head for the right mouth shape. Using Edit Mesh with Affect Area turned on is useful for dragging parts of the face into position. Depending on your character, you can make the differences extreme or subtle. Then pick your different mouth shapes as morph targets from the base mesh.



3 Using the Track editor, import a WAV file of the dialogue into your soundtrack – it serves as a guide for creating morph keys. Dragging the playback head, you can hear the voice, and click Set Morph Key for whichever mouth shape you want at the appropriate point. *MAX* creates a morph between one mouth shape and the next. Don't make a key for every letter in a word, just the most significant mouth movements for your character.

4 Test-render your animation. Character meshes are too complex to display in your Viewport window in real-time, even with the best graphics cards. The only way to see if your mouth is moving correctly is to render it. Once you've tweaked the results, you can load your character's scene and use Replace to swap the stationary face with your new, morphed version.

(left and above) You can animate characters' faces with a series of morph targets. The way a face moves when it's talking conveys personality – have some moving a great deal and others hardly at all to distinguish between them.

scene can take several seconds, or even minutes, to update as you move from frame to frame. But with all except the essentials hidden, you can manipulate and play back your animation in the Camera View window to see what your work will look like.

Meteor storm

The meteor storm is a good place to begin. It's made of hundreds of asteroids, each with its own motion path and rotation. You could create and animate each one independently, but it's much quicker to build a particle system and design a meteor, then use it as a blueprint for one of *3D Studio*'s Super-Spray particle systems. These enable you to generate multiple copies of an object, each with its own speed, direction, size and rotation.

To make things more interesting, you can also construct two more meteors as fragments of your original shape; then set up a Deflector Space Warp and choose your ship's hull as the Deflector shape. If you bind this to the meteor particle spray, you can set the deflector so that any meteor that hits it is replaced by two fragments.

The result is a complex-looking shot: hundreds of meteors rush toward your ship, and whenever one hits the hull, it appears to split into fragments which fly off in another direction.

There's more to our meteor storm than this, however. It's supposed to be caused by Ariel, a powerful spirit. We're representing him as a computer with the ability to alter its shape. In its native form, Ariel is a frogspawn-like substance, which constantly pulsates and wobbles. You can achieve this effect by using two separate particle clouds occupying the same position. Give them the same motion settings, configured so each particle oscillates randomly back and forth while hanging in space, but give them different appearances. Set one cloud to produce tiny glowing orange spheres (the entities within the spawn), and for the other, use much larger meta-particles in a semi-transparent material to depict the gel which holds Ariel together. Meta-particles are spheres that meld into one particle when they come close together, like congealing drops of liquid.

Frogspawn spirit

Once you've set this system up, place the meteor particle system into its centre, then copy it for a second gel system to follow the path of the asteroids. It's effective to adjust this one so the gel slowly disappears as the meteor moves away from its creation point, in the centre of Ariel.

The result is that Ariel's frogspawn appears in space, throwing out globules of gel in the direction of your ship, each one solidifying into an asteroid as it flies. All you need now is a lens flare effect to create the vortex from which Ariel appears – *ProOpticSuite* will do the job.

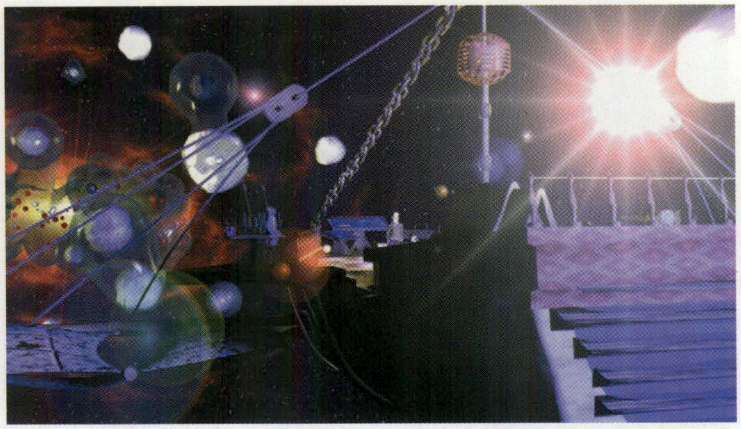
Finally, you want some of the meteors to explode under fire from the ship's defences. The easiest way is to create special meteors and hide them among the particle system asteroids. Then you can use *ProOpticSuite's Pyrocluster* plug-in to destroy them – it's an excellent plug-in for incredibly realistic smoke, fire and explosion animations, and even includes an extra A-bomb particle system specifically for mushroom clouds.

Motion capture under fire

After you've animated the meteors, you can work on the way your ship responds to them. Its guns should move and fire, and we want it to shake when it's hit. It's hard to animate this kind of random-like motion realistically, but motion capture is the answer: it enables you to create keyframes for any animation track by assigning its value to the movement of your joystick, ⇨

> *"Motion capture is one of the most under-used functions of MAX. It enables you to create keyframes for animation with your joystick, mouse or keyboard..."*

Use the *Pyrocluster* plug-in for brilliant explosion and fireball effects.



The scene comes together, with particle systems, lens flares and modelling.

mouse or keyboard. Then you can play through your animation, and record the motion freehand as you go.

For example, we want our ship's guns to move left, right, up and down to shoot meteors out of the sky. The movement needs to be complex and natural. Rather than producing a sequence of keyframes, it's quicker and more natural to assign the horizontal and vertical rotation of the gun to the motion of your mouse, and record the movement by hand. You could expand this technique by applying slight freehand motions to the movement of your camera in some scenes, for a hand-held 'real-life' look. It takes a while to perfect, though.

> *"It's quicker and more natural to assign the horizontal and vertical rotation of the gun to the motion of your mouse, and record the movement by hand..."*

Another level

When it comes to getting the characters moving, our animation takes on a new level of complexity. The problem – or at least one of them – is the way people and objects interact with each other. One day, collision detection will be a standard part of 3D animation; one day, you won't have to worry about your characters' limbs sliding through solid objects and other parts of their own bodies.

But for now, even the simplest motions – pressing a button, leaning against a wall, a car crash – take a great deal of work and often the results are imperfect. Look at the latest Hollywood offerings, even, and you'll see moments where the physical interaction between characters and objects just doesn't look right.

Troubleshooting moment

The more complex your scene, the more you have to deal with intersections between objects which are only supposed to touch. It's virtually impossible to spot when objects partially pass through each other, in a wireframe view. The only way to be sure is to test-render your scene.

Once you've identified a problem, it's often hard to fix. Sometimes your best option is to choose a camera angle where the intersection isn't noticeable. If you can't do that, you'll have to tweak your animation. You might be able to move your keyframes a little at the crucial point, and if you

Interpolation

Natural movement is vital for a convincing animation

One of the most infuriating and flexible aspects of 3D animation is interpolation between keyframes: if you want to make an object move between two points, you set a keyframe at the beginning with your object at its start point, and one at the end with the object in its final position. The software then calculates 'tweens' – intervening frames where your object is somewhere between its start and end position (hence 'tweening', which is the same as interpolation).

Your program has to interpolate the object's movement, creating a path between the start and end points. This is easy if you have just two points, but if you're working with more complex animations, things get tougher. If you insert a third keyframe between the first two, and move your object to another position, the software has to decide how to move the object. It could just move it at constant speed to each point, and then on to the next; but more often, you want the motion to describe a more natural curve.

Sometimes it's obvious how your object should move, and it can be frustrating if your computer won't do it. For example, in defining keyframes for a car chase, you want the cars to overshoot each keyframe as they skid around corners – but apply the same motion to the camera following, and you'll miss the action as it slides off the road. The camera needs to stick closely to the points you've given it.

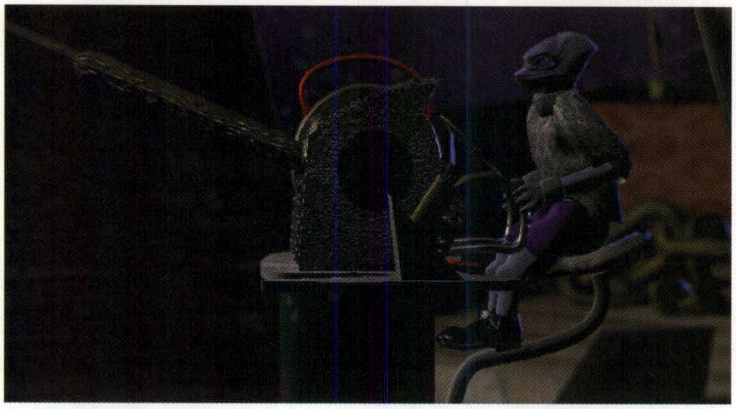
MAX provides a range of options, by enabling you to define how the animation goes into and out of each keyframe – whether it slows down before the keyframe, then accelerates away (like a racing car going into a bend), or whether it's brought to an abrupt halt at the keyframe and sent hurtling off towards the next (like a ball bouncing off a wall).

A useful way to define your animations is to click on your Motion tab, and switch to Trajectories, which displays the motion path of your object. Then you can bring up a track view and right-click on one of your keyframes to alter its In and Out values. The Trajectory view enables you to see how your changes affect the motion path. But don't try to solve motion problems by adding more keyframes – it can make matters worse!

can it's usually the best answer. If you do have to add more keyframes to your motion, do so sparingly – the more you add artificially, the less natural the movement will seem, as your object jerks about without any forces to explain it visually. It helps if you think in terms of the forces applied to your objects, rather than where you want them to move to.

In fact, a package dealing in terms of keyforces rather than keyframes would be a great service to 3D animation. Instead of deciding where each motion took your object, you would create moments of force attracting or repelling objects in certain directions at certain times – a paradigm which might provide a more natural set of animation tools.

In part four (p90), we'll be putting the finishing touches to our animation, rendering and editing it, as well as adding music and sound effects. **ca›s**

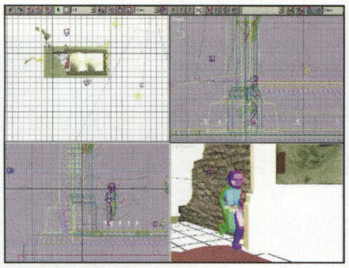


The motion of the guns needs to be fast and complex. We used motion capture to record their movements in real-time.

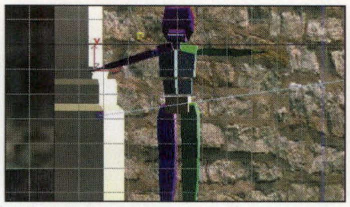
> *"One day, collision detection will be a standard part of 3D animation. But for now even the simplest motions take a lot of work"*

Action with plug-ins

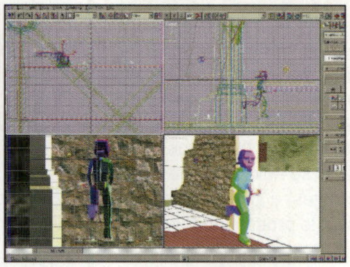
A woman dashes into a room, stops, and starts a conversation. She's wearing a dress, which ripples like real fabric. It's a complex set of motions, but we can use *Character Studio* and *ClothReyes* to achieve it.



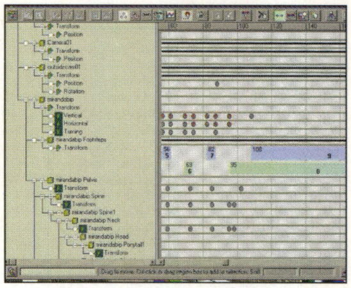
1 Hide everything except your biped – trying to animate with everything else visible is impossible. *Character Studio* has a simple character mesh which you can animate. When finished, you can hide it and un-hide your own more detailed constructions.



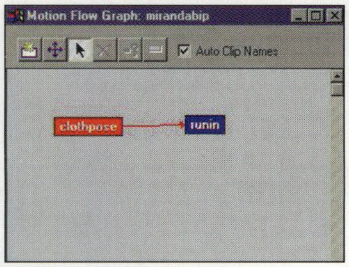
2 Construct the first three stages of your animation separately, and save them as BIP files. Make stage one the standard biped reference pose – we have to begin with our character in this position (standing with its arms out to the sides), because the clothing has been fitted in this position. *ClothReyes* needs to let it settle into place over the first few frames.



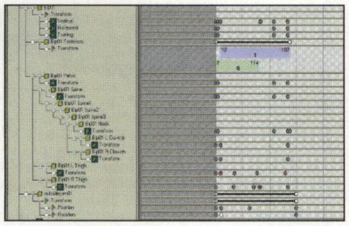
3 The running part of the animation is fairly simple too. *Character Studio* is a footstep-driven plug-in, so all you need to do is to place footprints into your scene and specify that the character is running rather than walking. The software does the rest.



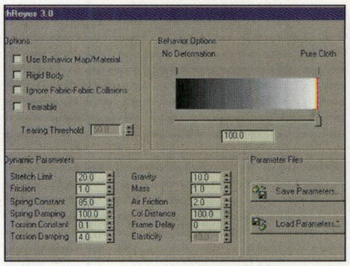
4 Now, add your character's last steps to bring her to a stop. Using Track view, you can drag out the length of the final footsteps. This leaves a period at the end of the animation where you can add her speech and gestures.



5 Switch *Character Studio* to Motion Blend mode and import your separate animations. The program automatically calculates blending frames to ease the motions into each other. You can play the result back to see if you need to adjust anything.



6 Add your character's personal idiosyncrasies by putting *MAX* into Animation mode, then click the Keyframe button. Now, when you select any body-part, you can use the Step-forward and Step-back buttons to locate each keyframe *Character Studio* has set for it. Altering positions at these frames creates a smooth and natural motion.



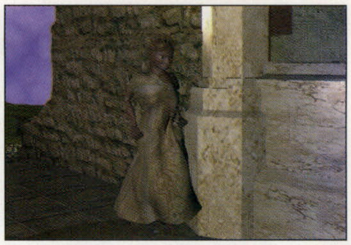
hReyes 3.0

Options
☐ Use Behavior Map/Material
☐ Rigid Body
☐ Ignore Fabric-Fabric Collisions
☐ Tearable
Tearing Threshold 50.0

Behavior Options
No Deformation
Pure Cloth
100.0

Dynamic Parameters
Stretch Limit 20.0
Friction 1.0
Spring Constant 85.0
Spring Damping 100.0
Torsion Constant 0.1
Torsion Damping 4.0
Gravity 10.0
Mass 1.0
Air Friction 2.0
Col Distance 100.0
Frame Delay 0
Elasticity

7 Un-hide the full mesh of your character. Now you can select her clothes and body, and apply *ClothReyes* to them. This is remarkably easy – just create a *ClothReyes* scene, decide which of the objects will be cloth and solid, and adjust the parameters of your fabric.



8 *ClothReyes* does its calculations. This can take time, so make sure you only include objects which will be directly affected by the cloth. The plug-in is temperamental, and its calculations can often take longer than rendering the completed scene. That said, the finished results can be stunning.

Digital animation masterclass: part four

Lights, camera, render, action!

THE MOMENT WE'VE BEEN WAITING FOR IS HERE: OUR ANIMATION OF *THE TEMPEST* IS FINALLY READY TO RENDER. TAKE A DEEP BREATH...

Over the last four parts of this series – which began on page 78 – we've been creating a five-minute opening sequence for an animated, sci-fi version of Shakespeare's *The Tempest*. First we designed the sets, and created the characters. In part two, we produced the textures and recorded the dialogue. Then over the last four pages, we put the lot together to animate the scenes.

So now we come to the final stages, a grand finale: pulling the whole production together. We have to create a final edit, layer sound effects on to it, do a few extra-special effects that couldn't be done in *3D Studio MAX*, and create music for the piece. Before any of this, however, we need to get rendering...

Rendering a project like this takes a while. Even on the system we used, each frame takes between 3-15 minutes to render, depending on what's in it. We originally rendered it at broadcast resolution, because it

> *"Rendering a project like this takes a while. Even on the system we used, each frame takes between 3-15 minutes to render, depending on what's in it..."*

Impressive rendering. The whole movie took over 625 hours to render, averaging five minutes per frame on a Pentium Pro 330 with 128MB RAM. We used *Character Studio* for the dialogue (top right), and *ProOpticSuite* for the fire effects (above right). If you're really serious you can set up a tiny render farm by linking two PCs – even a slow one will help.

The extras

What gear did we use?

The software:

ProOpticSuite – for lighting and explosion effects.

Adobe *Premiere* – for editing the final production.

Steinberg *Cubase Score* – for creating the incidental music.

Ulead *VideoPaint* – for adding the finishing touches and special effects.

3D Studio MAX – for design and rendering.

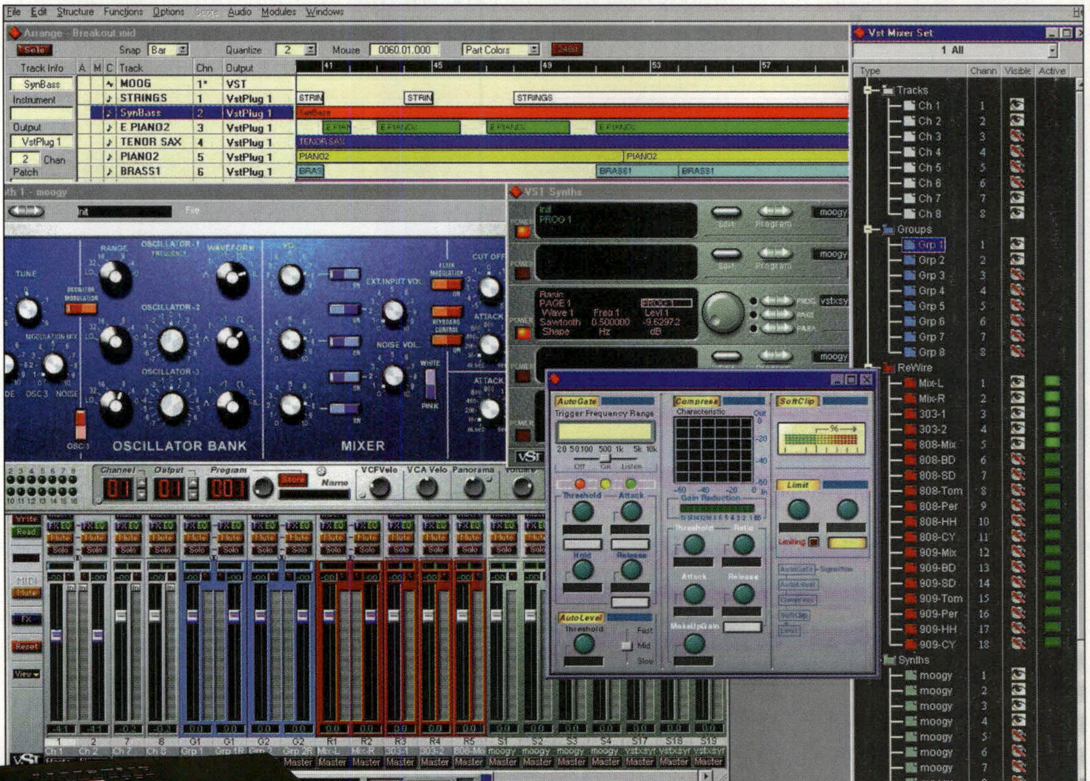
The plug-ins:

Character Studio – for animating our bipeds.
ClothReyes – for animating clothes.

The hardware:

Roland XP-10 – a decent MIDI keyboard can produce the sound of an entire orchestra and more. It's possible to use your sound card's internal synth, but a touch-sensitive keyboard is the best way to play music into your system.

For the soundtrack, see if you can get your hands on a sequencer like *Cubase* (right) or *Cakewalk*, and a decent MIDI keyboard, like the Roland XP-10 (below).



needed to be transferred to videotape – but for CD use we also had to render a reduced resolution MOV file. Broadcast resolution is 768x576 pixels, although we used 768x415, to give film a cinematic letterbox format.

Doing the maths, this means that with an average of five minutes per frame, and 25 frames per second, a five-minute movie takes 625 hours to render – that's 26 days and nights.

In fact, it took longer, and there were two reasons for this. First, like all good film makers, we created more footage than we would eventually use, to allow us plenty of freedom at the editing stage.

And second, each time you render a scene, you have to check it for any unforeseen problems. If you find textures that don't look quite right in every frame, or that some objects accidentally intersect each other, or if the lighting unexpectedly illuminates parts of a model that aren't supposed to show, then you're going to have to render the scene again.

In addition to this, *3D Studio MAX* – under Windows 98 and especially with the plug-ins we're using – is less stable than a one-legged drunken uranium juggler going through a deep emotional crisis on a unicycle. Ahem.

Break it up

Of course, we couldn't render the project as one long, complete animation. That would have been completely unmanageable. Instead, we had to break it down into a number of different *MAX* files, with each of these files representing a few seconds of animation.

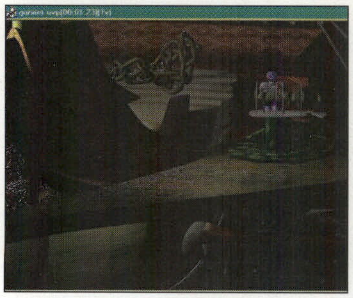
We started by making a basic scene with all the sets and characters in place, and then set up the camera angle for the shot we were working on. Then we created the animation, and saved the scene under a different name – doing it in this way makes it easier to fine-tune your animation without worrying about how your changes will affect later scenes.

This process created a great deal of large *MAX* files (they amounted to more than 2GB in the end), but you can then load these up and render them one at a time overnight. It would've been better if we'd had a dedicated PC for rendering – but as ⇛

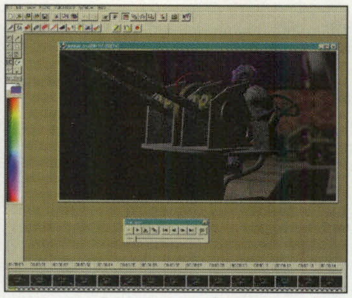
> ***"It would've been better if we'd had a dedicated PC for rendering – but as it was, the process took a good two-and-a-half months, with the computer beavering away all night, every night..."***

Laser action

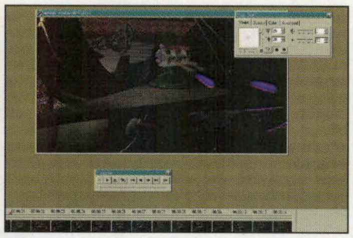
In a project like this, not everything is best done in *MAX*. For the finishing touches we needed to lay a track of laser fire, shooting randomly in front of and behind our characters. We wanted the lasers to be constant and apparently random, which would have been a real headache to simulate using *MAX*. So instead we used Ulead's *VideoPaint*...



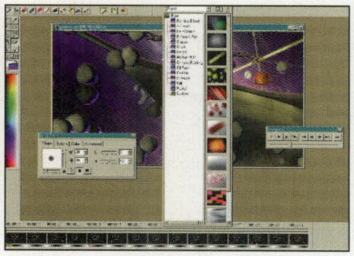
1 First, we needed to find the sections of the film where we wanted to add the laser fire effects, and then export them from the editing software as a single movie file. Then we could import this into *VideoPaint*.



2 The program's Video Controller enables you to step back and forth through the video to find the place where you want to add the effect. You can work forwards or backwards, or work on whichever frame is most convenient.



3 Using the Airbrush, we drew the laser onto the first frame as a soft-edged blue line. Then we used the Controller to step on a frame, and draw in the laser bolt again, slightly further on. We created fast-moving shots, with each bolt taking about four frames to cross the screen – and we put in rather a lot of them too.



4 Once you've drawn in all the animated elements, you can render the scene back out under a new name, and take a look at your work. *VideoPaint* is an incredibly useful effects tool, and we could have used it more. In fact, if you're prepared to edit frame-by-frame, you can achieve virtually anything.

it was, the process took a good two-and-a-half months, with the computer beavering away all night, every night.

The road is long

If our five-minute section took 625 hours to render, the finished 90-minute movie would take 469 days, working 24-hours-a-day. That means you could do it in a couple of months, if you had a bank of ten PCs running constantly.

That's building the film at broadcast quality. Now here's the shocker. If you wanted to make the movie for the big screen, you'd have to work at four times the resolution. That means 16 (or 4x4) times more pixels to render, with an average frame taking 80 minutes. So, for a cinematic production, we'd need 100 computers working day in, day out for two-and-a-half months, or one PC for 20 years.

Do try this at home

With all the footage collected (we had a bulky 100 AVI files, each holding up to ten seconds of video), we could start editing them. We used Adobe *Premiere* (it's an excellent package, plus we know it well) but most editing programs could handle the edit for this film without too much trouble. There were a couple of mixes and fades to include, and a few invisible edits were necessary (where the rendering had been interrupted, and two separate video clips had to be joined). Apart from that, the edit is standard.

Feel the noise…

The audio track, however, was another matter. With any animated film, the audio is tricky. You don't have a

> ***"With any animated film, the audio is tricky. You don't have a track attached to your footage as you do in real life. You have to invent every noise you want to hear…"***

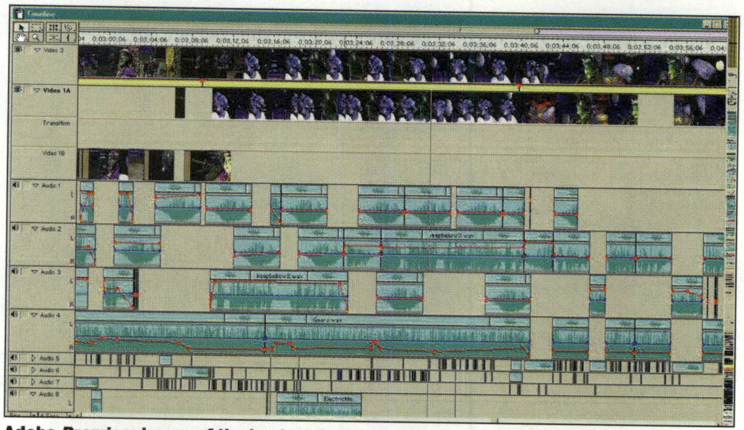
Music with meaning

When you create music for your piece, take the story and its setting into consideration…

When you're creating sound for an animation, you have to be aware of the way noise is recorded in live action films. If you're shooting a long shot in real life, then the sound is quieter. When you cut to a close-up, it gets louder – simply because the microphone is closer to whatever it's recording. Film makers spend a lot of time trying to avoid this happening, because they want to smooth the transition between different shots. In animation, however, you often want to do the reverse, by deliberately altering the volume of your effects at edit points. This helps convince the viewer that your sound is part of the action, so it doesn't look too 'dubbed'.

We wanted to preserve the original feeling of *The Tempest*, even though our version has a futuristic setting. The ship, although it's a spaceship, is much like an old square rigger, and all the models are weathered and ancient-looking. We decided we wanted the sound effects to reflect the original setting of the play as well, so we've used a lot of watery noises. The ship makes sounds as though it's filled with gears and pistons, and which give the void of space an atmosphere. To create this sound, we used a sea noise slowed down to form a barely audible background rumble.

Ariel, the spirit which created the storm, makes a noise which we derived from the sound of seagulls. We sampled, reversed and modulated this sound with *Premiere 5*'s new sound filters. The idea was to build a sound which reflects the kind of turmoil within Ariel, which you can also see visually in its constantly undulating form. Don't underestimate sound – it can make or break a film.



Adobe *Premiere* is one of the best packages on the market for editing video footage. Alternatively, you could go for Ulead *MediaStudio Pro* or Puffin Designs' *Commotion*.

> "We had to do a bit of tweaking to make the dialogue clearer... Once we started working with the XL1 digital camcorder microphone, the sound quality improved tremendously"

synchronous audio track attached to your footage as you do when it's shot in real life. Instead, you have to invent, sample, edit and position every single noise you want to hear. For a sophisticated soundtrack, this takes skill, patience and attention to detail.

In our film, we created a scene in which a spaceship is caught in a meteor storm, and then destroyed after a brief battle. This needs layers and layers of sounds, none of which you can readily record in the real world. We could easily have spent a month or more on the sound effects track, but deadlines press, so we had to do the whole lot in a few days.

All in all, we used nine sound effects tracks. We didn't organise them into any kind of order, although life would probably have been easier if we had used track one for dialogue, track two for background sounds, track three for lasers, and so on.

Also, we didn't include the music at this stage. We rendered the movie with all its sound effects as an AVI file, then imported it back into *Premiere* for the titles and music to be added. This made life easier, because it meant we could then fade the effects layer up and down as a whole, rather than having to alter every tiny effect.

We also had to do a bit of tweaking to make the dialogue clearer, above the other sounds. This wasn't completely successful with all the dialogue, however, because we made the first recordings with a lower quality microphone. Once we started working with the microphone on Canon's XL1 digital camcorder, the sound quality improved tremendously.

Grand finale

With all of this done, the film was more or less complete. All we needed was to output the completed production, and optimise it for playback on CD-ROM – which is a mostly matter of trial and error. We had to render sections of the movie using different rendering settings, until one looked good enough to try on the full film. The finished version looks pretty sharp, but its data-rate sometimes peaks rather higher than we would have liked, and this might cause occasional stutters on lower speed drives.

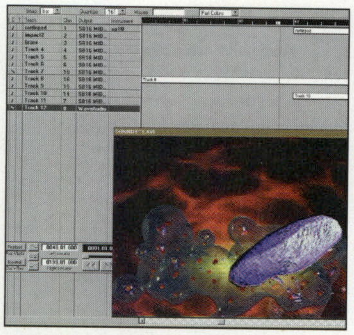
How did our finished project turn out? Well, we think it's quite good, but give the techniques a whirl for yourself, and see what you can create. ca»s

Information

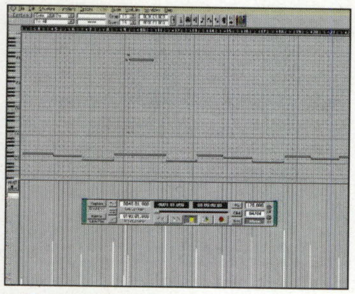
Expertise supplied by Christian Darkin, on e christian.darkin@demon.co.uk

Compose yourself

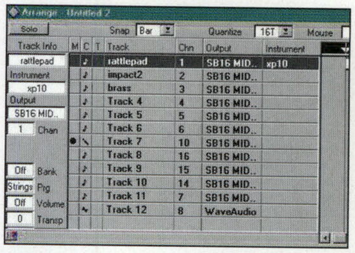
We produced the incidental music with the Roland XP-10, a MIDI keyboard – but it's quite possible to create a decent soundtrack with your internal sound card instead. You'll also need a sequencer, like *Cubase Score*...



1 **Using *Cubase*'s AVI monitor, you can import your movie file directly into the sequencing package. This means you can compose music while watching the film, and everything is in sequence when you output your musical score.**



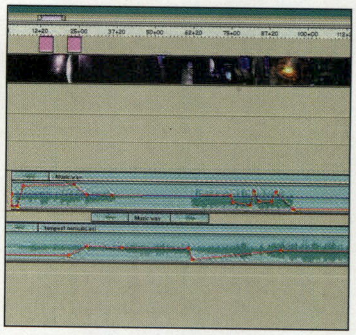
2 **We created some very simple music for the opening of the movie. First, we hit Record and played in some simple slow chords on the keyboard's lowest octave. Then this became the background. We also added some higher notes, to highlight events like the sun rising over the planet's surface.**



Track Info
rattlepad
Instrument: xp10
Output: SB16 MID..
1 Chan
Off Bank
Strings Prg
Off Volume
0 Transp

M	C	T	Track	Chn	Output	Instrument
	♪		rattlepad	1	SB16 MID..	xp10
	♪		impact2	2	SB16 MID..	
	♪		brass	3	SB16 MID..	
	♪		Track 4	4	SB16 MID..	
	♪		Track 5	5	SB16 MID..	
	♪		Track 6	6	SB16 MID..	
●	\		Track 7	10	SB16 MID..	
	♪		Track 8	16	SB16 MID..	
	♪		Track 9	15	SB16 MID..	
	♪		Track 10	14	SB16 MID..	
	♪		Track 11	7	SB16 MID..	
	∿		Track 12	8	WaveAudio	

3 **To get a fuller sound, we copied the opening chords several times onto different tracks. Using the Program Change option, you can give each track a different instrument. The result is a combination of strings, brass and reed instruments all mixed together. To get a wider range, we used Transpose to move each instrument up or down an octave (12 notes) or two.**



4 **We recorded the finished piece as a WAV file, and imported it into *Premiere* to be mixed into a sound track on the video. Finally, we used the Rubber Band volume control on the sound file to fade the music in and out as appropriate.**

computer arts special
The definitive guide to digital video • Mac & PC

cas 04

interactive

Full software, upgrades, demos, movies, walkthroughs and resources

CD Index

CD-ROM basics

Your quick guide to getting started and getting the best from this *Computer Arts 3D Special* CD

1 How do I start the CD?

The CD should auto-run when you insert it into your computer's CD drive. If not, run either:
- ▸ CAiSpecMac if you're on a Mac.
- ▸ CAiSpecWin32.exe if you're on Windows 95, 98 or NT.

To toggle auto-run on and off, use the appropriate Control Panel on your computer.

2 Is there any Windows 3.1 software on the CD?

No. We no longer support Windows 3.1 on the PC, or indeed 68K on the Macintosh. This is due to the high demands placed on computers by today's interactive multimedia. The *Computer Arts* CD interface will run under a Mac PPC or G3, and Windows 95 or higher.

3 Do I need any specific software to run the CD?

You'll need Apple's *QuickTime* digital video software in order to make full use of the CD interface. It's on the CD, and you'll be prompted to install it if you haven't got it.

If you're using a Mac, then the CD interface will work fine with any version of *QuickTime* installed. If, however, you're using Windows and have *QuickTime 3.X* installed, the interface may claim that *QuickTime* is not installed on your computer.

If this happens, please install version 2.1.2 of *QuickTime* (which you'll find in Resources on the CD), in addition to *QuickTime 3.X*. This will not erase your installation of *QuickTime 3.X* and will solve the problems.

You also need Web browser software and an active Web connection to make use of the Web-linked features of the CD. Please ensure you're using one of the following browsers to make use of this functionality:
- ▸ Microsoft *Internet Explorer 3* or higher.
- ▸ Netscape *Navigator 3* or higher (from **w** www.netscape.com).

Please ensure you're connected to your ISP before starting the CD if you intend to use the Web-linked features.

4 What if I need further assistance with the CD?

Contact our Technical Support department via the following means, and in this order:
- ▸ **e** support@futurenet.co.uk
- ▸ **w** www.futurenet.com/support
- ▸ **f** 01225 732 279
- ▸ **t** 01225 442 244 (lines can be very busy)

Visit **w** www.futurenet.com/support and you'll be able to check out a list of the most frequently asked questions about the *Computer Arts* CD. This Website is kept up-to-date with all the latest info, and has links for the downloading of any patches where applicable and available.

5 What if I have a faulty CD?

This is rare – but if confirmed by Technical Support, please return your CD to the following address and a free replacement will arrive within 28 days: Returns Dept, TIB plc, Unit 5, Triangle Business Park, Pentrebach, Merthyr Tydfil, Mid Glamorgan, CF48 4YB.

Demos

Dual demos PCSoft\Demos (PC & Mac)

- ▸ After Effects 4
- ▸ Commotion 2.1
- ▸ effect* 2.0
- ▸ paint* 2.0
- ▸ Media Cleaner Pro 4
- ▸ Premiere 5
- ▸ MediaPaint 1.0

PC only PCSoft\Demos

- ▸ Media Studio Pro 5.0

Mac only demos MacSoft\Demos

- ▸ VideoShop 4.5

Resources

Dual PCSoft\Resources (PC) MacSoft\Resources (Mac)

- ▸ Acrobat Reader 3
- ▸ QuickTime 4.0

Movies

Showreel CD root

- ▸ Showreel, Spring 1999 – Mirashade – Mirashade.mov
- ▸ Showreel, Summer 1999 – Rushes – Rushes.mov
- ▸ Desktop film making tutorial, the finished movie – Moving – DesktopFilMake.mov
- ▸ Special effects tutorial, the finished movie – The Chase – Chase.mov
- ▸ Showreel, 1999 – Abbey Road Interactive – AbbeyRoad.mov

Extra files

Adobe After Effects Tour Dual\...

▸ Take a virtual trip around Adobe's powerful visual effects package.

ArtBeats Sampler

▸ A collection of low-res movie clips from the excellent ArtBeats series of clip media. For more information, visit its Website at **w** www.artbeats.com, or e-mail **e** facts@artbeats.com

Desktop Film Making Tutorial

▸ All the files for the massive tutorial which starts on page 22. Some of these files are very large, so make sure you have the required hard disk space of at least 135MB free before you copy them.

Featured software

Movies CD root

Mirashade Showreel, Spring 1999

▸ Mirashade is profiled on page 76, and this is the company's superb showreel. For more information, contact **t** 0118 975 5255 or visit **w** www.mirashade.com

Rushes Showreel, Summer 1999

▸ Take a look at page 48 to see our profile of Rushes, the brilliant Soho-based post production facility. For more information, visit **w** www.rushes.co.uk

The music for this showreel is by Michael Coleman. It's a track called *Cold Comfort*, and you can contact him on **e** glow@george44.freeserve.co.uk

Abbey Road Interactive Showreel, 1999

▸ This is a movie showreel for the famous Abbey Road Studio based Abbey Road Interactive. Check out the profile on page 60. You can contact the company on **t** 0171 266 7282.

Desktop Film Making tutorial Moving

▸ This movie is the result of the tutorial which kicks off on page 56.

Special Effects tutorial The Chase

▸ This film shows the use of the effects covered by the tutorial which starts on page 40.

Demo software

After Effects 4 Demo version (dual)

Full product: £587
Adobe
t 0181 606 4001
w www.adobe.co.uk

Why is this included?
To go with the tutorial which starts on page 40.

PC system requirements:
Min: *P90 ▸ 64RAM ▸ Win 95/NT 4.*
Mac system requirements:
Min: *PPC ▸ 32RAM ▸ Sys 7.6.1.*

Premiere 5 Demo version (dual)

Full product: £519
Adobe
t 0181 606 4001
w www.adobe.co.uk

Why is this included?
To go with the tutorial which can be found on page 22.

PC system requirements:
Min: *P90 ▸ 32RAM ▸ Win 95/NT.*
Mac system requirements:
Min: *PPC ▸ 32RAM ▸ Sys 7.5.5.*

Commotion 2 Demo version (dual)

Full product: £1992 (Mac upgrade £210)
BIT UK
t 01420 83811
w www.puffindesigns.com

Why is this included?
It's a terrific piece of digital video software!

PC system requirements:
Min: *P90 ▸ 64RAM ▸ Win NT 4.*
Mac system requirements:
Min: *PPC ▸ 64RAM ▸ Mac OS 8.*

paint* 2.0 Demo version (dual)

Full product: £1639
Kinetix
t 01483 303 322
w www.ktx.com

Why is this included?
To go with the tutorial which starts on page 28.

PC system requirements:
Min: *P200 ▸ 64RAM ▸ Win 95/NT.*
Mac system requirements:
Min: *PPC ▸ 64RAM ▸ Sys 7.5.*

effect* 2.0 Demo version (dual)

Full product: £1639
Kinetix
t 01483 303 322
w www.ktx.com

Why is this included?
For the tutorial which starts on page 28.

PC system requirements:
Min: *P200 ▸ 64RAM ▸ Win 95/NT.*
Mac system requirements:
Min: *PPC ▸ 64RAM ▸ Sys 7.5.*

Media Cleaner Pro 4

Demo version (dual)
Full product: £257
Computers Unlimited
t 0181 358 5857
w www.terran-int.com

Why is this included?
It's a superb package for compressing digital video media.

It says I need to register the demo. Is this correct?
Yes, but it's free! Just visit **w** www.terran-int.com to register your demo. What you need to do is follow the process as if you were going to download the demo, by inputting your details, and you'll be given an unlock code before you have to download the demo.

PC system requirements:
Min: *P166 ▸ 32RAM ▸ Win 95/NT.*
Mac system requirements:
Min: *PPC ▸ 16RAM ▸ Mac OS 8.*

MediaPaint 1.0

Demo version (dual)
Full product: $249
Strata
t Buy on-line
w www.strata3d.com

Why is this included?
It's a great visual effects package for digital video.

PC system requirements:
Min: *P166 ▸ 64RAM ▸ Win 95/NT.*
Mac system requirements:
Min: *PPC ▸ 32RAM ▸ Sys 7.6.1.*

Media Studio Pro 5.0 Demo version (PC only)

Full product: £499
BIT UK
t 01420 83811
w www.ulead.com

Why is this included?
It's a brilliant complete suite of digital video tools.

System requirements:
Min: *P90 ▸ 16RAM ▸ Win 95.*

Strata VideoShop 4.5 Demo version

Full product: $495
Strata
t Buy on-line
w www.strata3d.com

Why is this included?
It's a powerful digital video editing package.

System requirements:
Min: *PPC ▸ 10RAM ▸ Sys 7.5.5 ▸ QT 2.5/QD3D 1.5.3.*

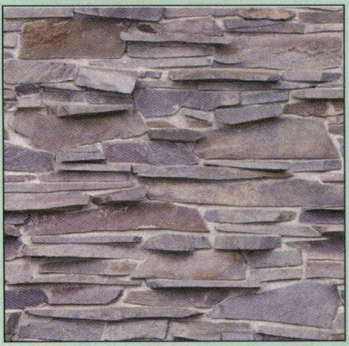
Dual clip media sampler

Dual\Artbeats Sampler (Mac and PC)

ArtBeats Digital Film Library Sampler
From: $39 – order on-line
Artbeats
t 001 541 863 4429
w www.artbeats.com

Why are these included?
Because they're a terrific idea – clip movies for digital video work.

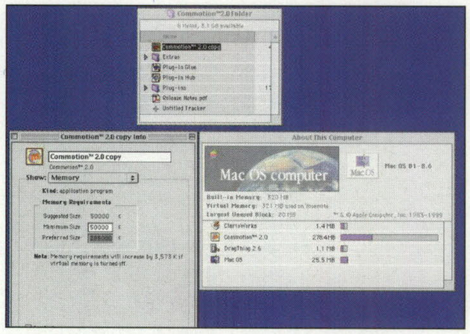
System requirements:
QuickTime and a QuickTime movie player. Extensis Portfolio is required for viewing of the movie catalogue. The demo of Portfolio 4.0 is available on the second CD on Computer Arts issue 36.



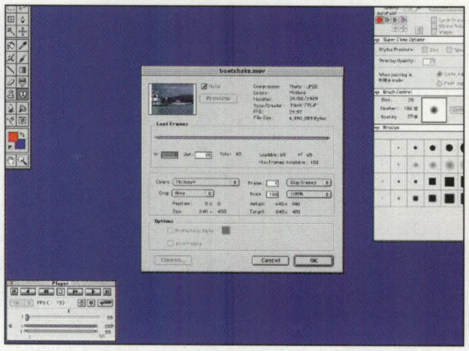
A ready supply of good stock video clips will save you in moments of crisis...

Stage One: Commotion 2

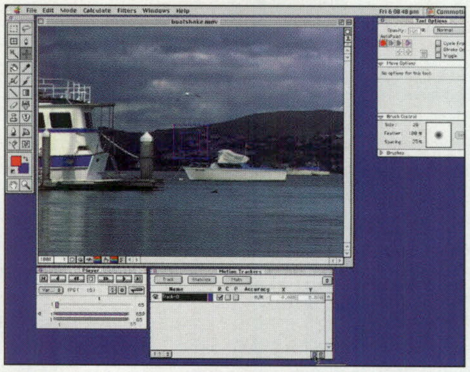
Want to get the most out of *Commotion*? Here we tidy up some footage using motion tracking and Super Clone tools...



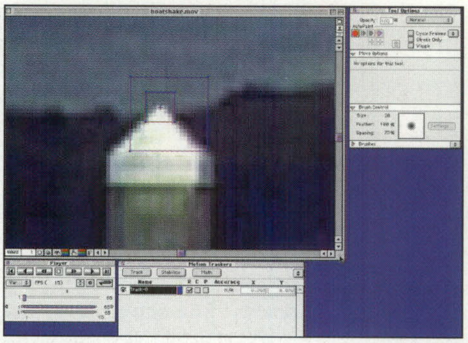
1 ***Commotion*** **is a powerful rotoscoping and video effects package that makes the most of today's hardware. It's important to give *Commotion* as much RAM as you can. Under Windows, this is done automatically. Under the Mac OS, choose Get Info in the Finder for *Commotion*, then set the preferred RAM to the amount of free RAM available – in the About This Computer window, minus about 10MB.**



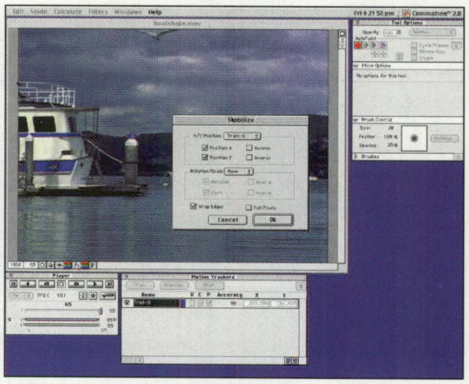
2 **We'll use *Commotion* to tidy up some footage using motion tracking and Super Clone tools. Open the file Boatshake from the CD and load in as many frames as you can fit into RAM (extend the blue slider as far you can). Although you wouldn't normally do this, you can scale the footage from the drop-down menu to get more frames in.**



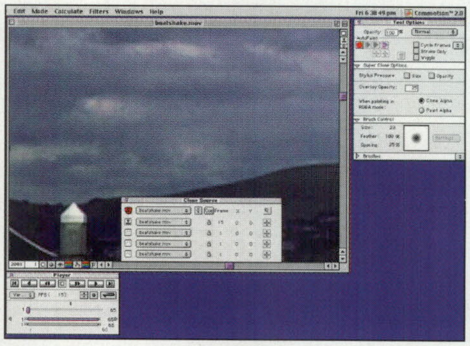
3 **Play the footage. Now we want to remove the seagull – to make this easier, first we must stabilise the footage. We can do this using motion tracking. Double-click the Motion Tracking tool and click the New Tracker icon in the Motion Tracking palette. A blue box should appear on screen.**



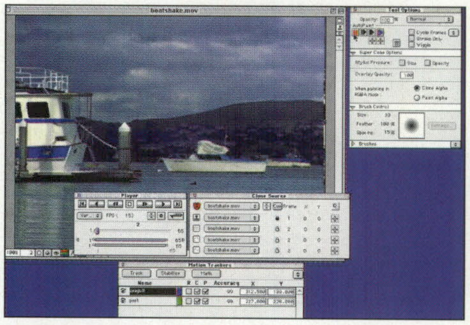
4 **Make sure you're on Frame 1, then move the Tracker cross-hair to the tip of the white post. Scale the inner tracking area to just around the tip. The outer area should be scaled no bigger than the greatest movement the tip makes from frame-to-frame. Click Track in the Motion Tracking palette, accept the default settings and wait for *Commotion* to finish.**



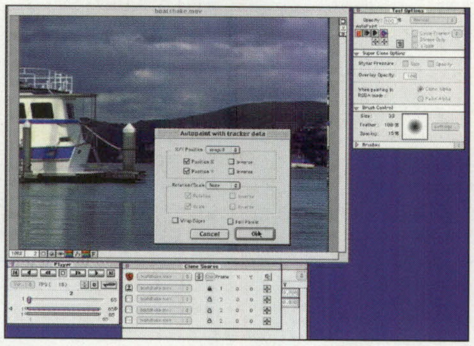
5 **The tip should be successfully tracked so you can now stabilise the footage. With the Tracker selected, click the Stabilise button. Then make sure Wrap Around is checked in the dialog. Play the footage and notice that the shake has now been eliminated!**



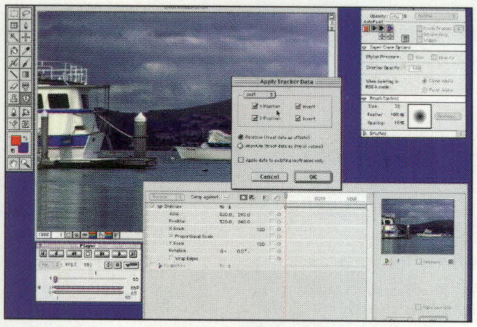
6 **We could now clone out the seagull in every frame, but this would be tedious. Double-click the Super Clone tool to access its options, and set the frame offset to 15 (first column, first row). As you paint over the seagull, you'll be cloning from Frame 15, where there's no seagull, onto Frame 1. We now have a seagull-less reference plate.**



7 **Next, track the seagull as you did with the post. Go to Frame 2 and set the Super Clone brush back to Frame 1 (it was 15). Then click the Lock icon so that the Clone Frame does not advance. In the Tool Option palette, click the red Autopaint button (red dot) and paint out the seagull with a large radius. Make sure the area you paint is large enough to cover the seagull in every frame.**



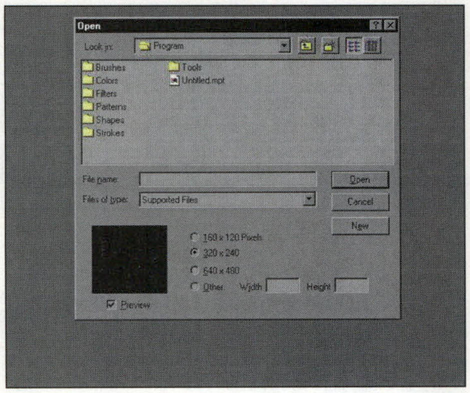
8 **Now we can use the recorded stroke and the motion-tracked data to remove the gull in all the other frames by cloning from our Clean Reference plate. Click the Apply Tracker to Frames button in the Tool Option palette (it's a small cross), and make sure the Seagull Tracker is selected and click OK. Watch Commotion paint out the gull automatically.**



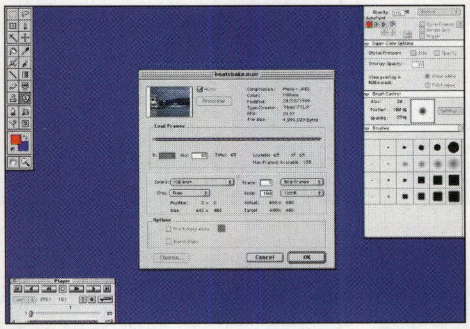
9 **You can clean up a few of the frames manually, but the bulk of the job has been done. For more precise work, can use multiple trackers on different parts of the object enabling you to use finer autopaint stokes. You can also put back the camera shake by using Filter>Stabilise>Stabilise Image filter and invert the motion tracker data. Because we used Wrap Around, none of the image data is lost.** ca>s

Stage Two: MediaPaint

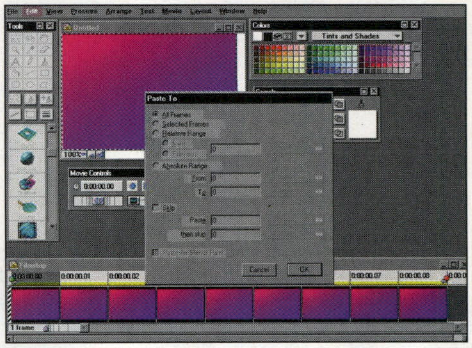
MediaPaint enables you to paint special effects on your video, frame by frame. Here's a crash course in how to use it...



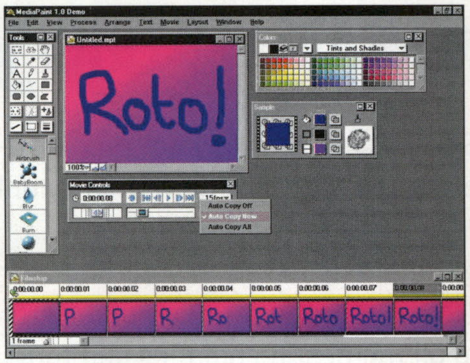
1 **On launching the *MediaPaint* demo, you're presented with a dialogue. Choose New and click OK to create a new blank document. Tick 320x240 for the size (it'll actually be limited to 300x200 pixels in this demo version, though).**



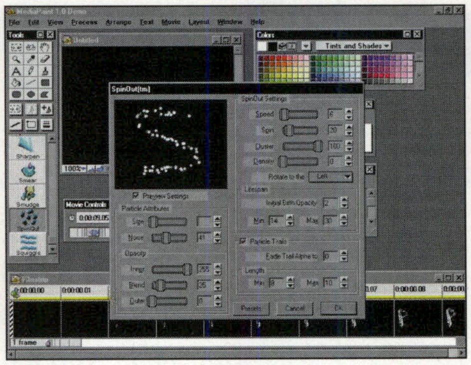
2 ***MediaPaint* puts a Paint layer above any Video layer, which we'll use to create some animated graphics. Fill your first frame with black using the Paint Bucket, to give yourself some pixels to work with. Then choose Edit>Select All, followed by Process>Colour Gradient. We've chosen red as our foreground colour and purple for the background. Click OK to fill the frame with the gradient, and save the file.**



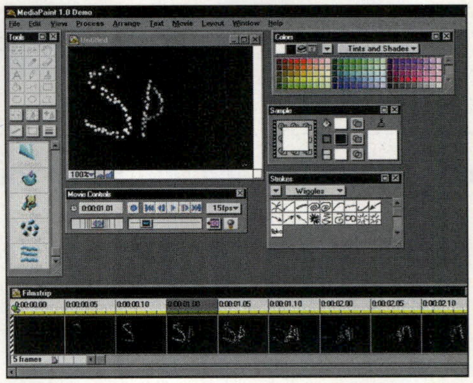
3 **Rather than do this for each and every frame, you can automate the process. Drag the red dot in the Filmstrip to set the duration of your document, then with the selection still active choose Edit>Copy, then Paste To... Click Proceed in the Warning that appears, then choose All Frames in the next dialog and click OK.**



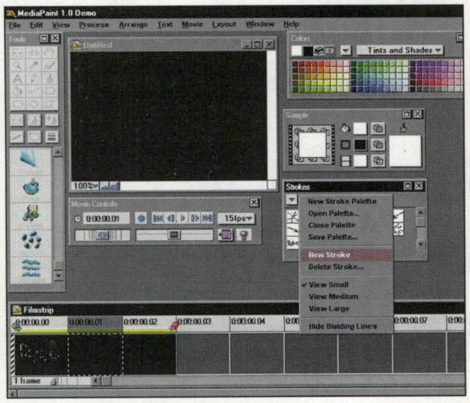
4 **In your Tools palette select the Airbrush. Double-click it and set your size, pressure and so on. In the Movie Controls, turn Auto Copy New on from the drop-down menu. Then advance one frame and begin painting the letters of a word. Each time you advance, paint some more.**



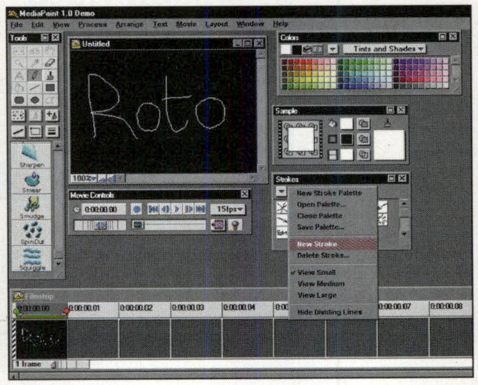
5 **That's a basic rotoscoping job, but *MediaPaint* can create more impressive effects than that. Start over with a new document, select your Spin Out tool from the Tools palette, and double click. Draw in the Preview window to get an idea of how the effect will look, accepting the default for now.**



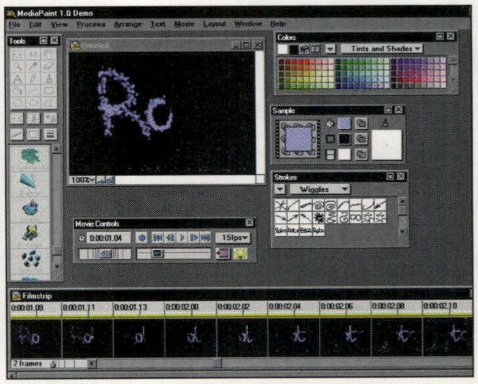
6 **In the Movie Controls window hit the Record button – it flashes until you begin painting. You can now paint on your document and it auto-advances as you paint. Press Stop when you're done, and play back the movie.**



7 **For a more controlled effect you can record the stroke first. Choose View> Show Strokes to make the Strokes palette visible. From the drop-down menu choose New Stroke.**

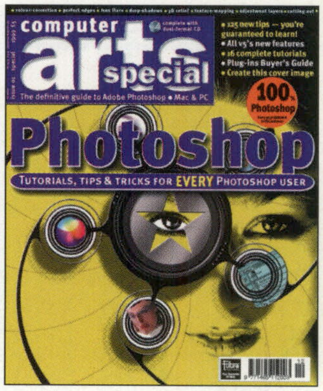


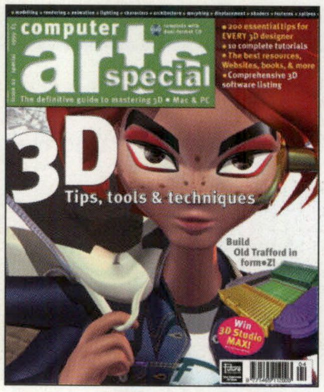
8 **Use the Pen tool for a better response, and draw your word. *MediaPaint* records the strokes you make so you can reuse them with other tools. When you're done, choose End Stroke from the Strokes palette drop-down menu.**



9 **Choose any of the other tools – Pixie Dust, Baby boom and so on – then click Record and, with your stroke selected in the Strokes palette, simply click in the document and watch your effect unfold automatically.**

The *Photoshop Special* was a sell-out, and the *3D*, *Web Design* and *Digital Video Specials* look like following suit. Why not subscribe and guarantee future copies of the *Specials* series drop on your doormat?





Subscribe to Computer Arts Specials & guarantee your copy

Cut out or photocopy and return this coupon

Title ________ Initials ________ Surname ____________

Address ____________

____________ Postcode/Zip ____________ Country ____________

Daytime telephone number ____________

computer arts special
The definitive guide to digital video • Mac & PC

Four Special issues

UK (cheque/credit card)	☐	£20
Europe (Inc. Eire)*	☐	£28
Rest of the world*	☐	£32

*AIRMAIL

Please choose your method of payment 1, 2 or 3

1 ☐ Cheque (payable to Future Publishing Ltd. Sterling cheques drawn on a UK account.)

2 ☐ Visa or ☐ MasterCard

3 ☐ Switch Issue No/Valid date ____________

Card No ____________ Expires ____________

Signature ____________ Date ____________

UK readers return this coupon to: *Computer Arts* Magazine, Subscriptions, Future Publishing Ltd, Freepost BS4900, Somerton, Somerset, TA11 6BR.

Overseas readers return (postage payable) to: *Computer Arts* Magazine, Subscriptions, Future Publishing Ltd, Cary Court, Somerton, Somerset, UK TA11 6TB.

☐ Please tick this box if you would prefer not to receive information on other offers.

Order number code: COS04

The *Computer Arts Specials* are certainly hot property – with the first issue selling out in record time. There's only one way to ensure you get your copy every time... Subscribe, and get them delivered to your door. This is your chance to get the next four *Computer Arts Specials* – you'll find all the best techniques and tools for a variety of computer art disciplines:

▸ **Digital video** ▸ **Photoshop** ▸ **3D** ▸ **Web design**

Each issue comes complete with a dual-format CD.

Call the hotline:

t +44 (0)1458 271 108

or e subs@futurenet.co.uk

Or fill in the form left (photocopy it if you don't want to ruin your magazine), sit back and wait!

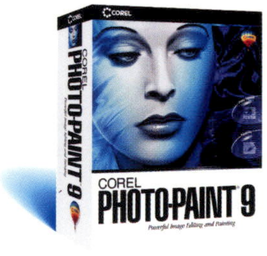
Please quote order code no: **COS04**

Alter Your Perspective.

With some designs, there's more than meets the eye. A lot more. Discover a new dimension in creative freedom with the panoramic QuickTime™ VR capabilities of Corel PHOTO-PAINT® 9. A complete application for powerful image editing and painting, Corel PHOTO-PAINT 9 delivers more. Artistic Media brushes, precision retouching features, more interactive tools than ever before—and QuickTime VR.

Welcome to the big picture.

Look again. And again.



Corel PHOTO-PAINT 9 is also included in CorelDRAW® 9 Graphics Suite.

Step into the picture at
www.designer.com/photo-paint_qtvr

This advertisement was designed and created using award-winning CorelDRAW and Corel PHOTO-PAINT graphics software.

Channel MarketMakers 02072 988505

Copyright © 1999 Corel Corporation. All rights reserved. Corel, Corel PHOTO-PAINT, CorelDRAW, the Go further logo and the Corel balloon logo are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. QuickTime is a trademark used under licence. QuickTime is registered in the U.S. and other countries. All other product, font and company names and logos are trademarks or registered trademarks of their respective corporations.

QuickTime™

COREL®

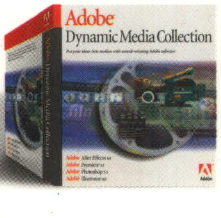
Go further™

Of course, by day two you can do a lot more.

Now includes NEW Adobe® Photoshop® 5.5

bottle shading.
Create new mesh point...
and add cool, soft highlight.
Arrange typography accurately.
Crop marks and colour points...
Spot c
mation footage...
luma matte flame explosion...
for maximum visual impact!
Adjust backdrop layer colours...
explodes into liquid chrome.
Custo
yed out.
Layer effects for button graphics.
Initial startup image...
selection grows as mask...
revealing chosen destination.
Gif an
terim movies.
Create panel texture maps...
and map onto 3D DXF models...
for realism and effect.
Titles roll in on 3D plane...
headi

A powerful new multimedia solution for graphics professionals.



Spin it. Distort it. Mask it. Fly it around the block and... basically do what you want with it. If you're looking to add dynamism to your work, Adobe® Dynamic Media Collection is the answer. It combines four industry-leading Adobe software packages into one tightly integrated, yet surprisingly affordable dynamic media solution. It's a desktop solution that works across platforms, allowing you to create stunning compositions that really bring your ideas to life. To see dynamic media in action now, visit us at www.adobe.co.uk or for more information call Adobe Systems on 0181 606 4001.

Adobe®

The Adobe Dynamic Media Collection contains Adobe After Effects,® Adobe Premiere,® Adobe Photoshop® and Adobe Illustrator®

® Adobe, the Adobe logo, After Effects, Illustrator, Photoshop, and Adobe Premiere are trade marks of Adobe Systems Incorporated and are registered in certain European countries. These marks have ® appended thereto.